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(54) **MITIGATING POLARIZATION PERFORMANCE LOSS WITH TILTED ANTENNA ARRAYS**

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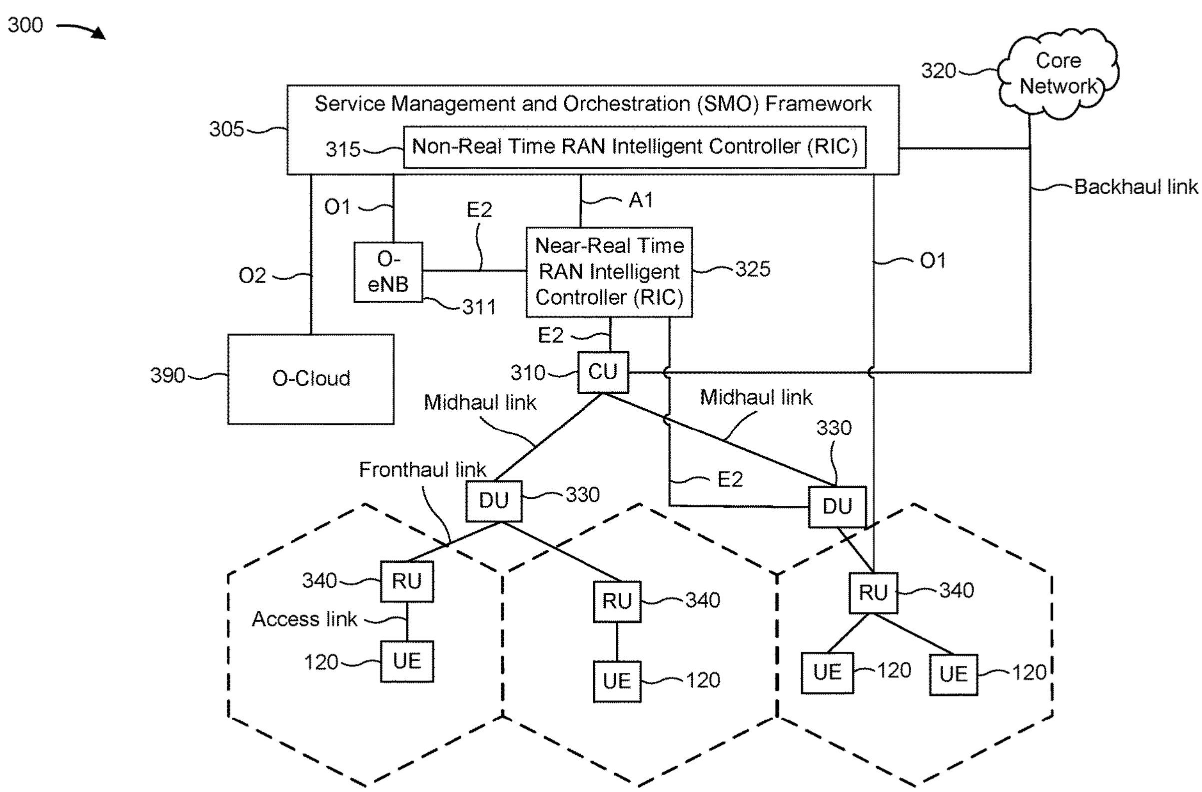
(57) **ABSTRACT**

Various aspects of the present disclosure generally relate to wireless communication. In some aspects, a user equipment (UE) may transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration and the second operating state corresponds to a second antenna configuration, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. The UE may receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication. Numerous other aspects are described.



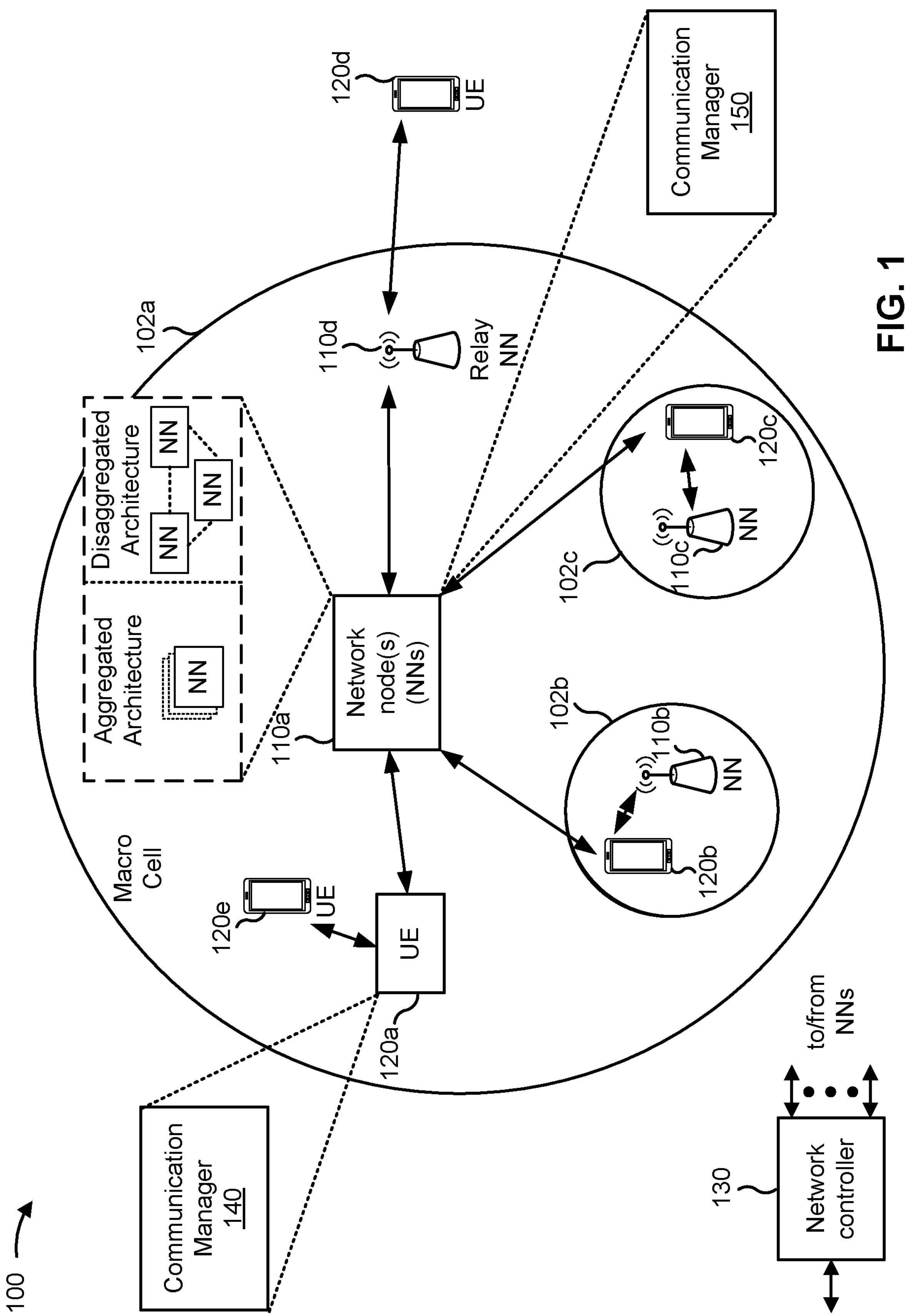

100
Communication Manager 140
Network controller
130
to/from NNs
120a
UE
120e
UE
Macro Cell
Aggregated Architecture
NN
Disaggregated Architecture
NN
NN
NN
110a
Network node(s) (NNs)
102b
110b
NN
120b
102c
110c
NN
120c
110d
Relay NN
102a
120d
UE
Communication Manager 150

FIG. 1

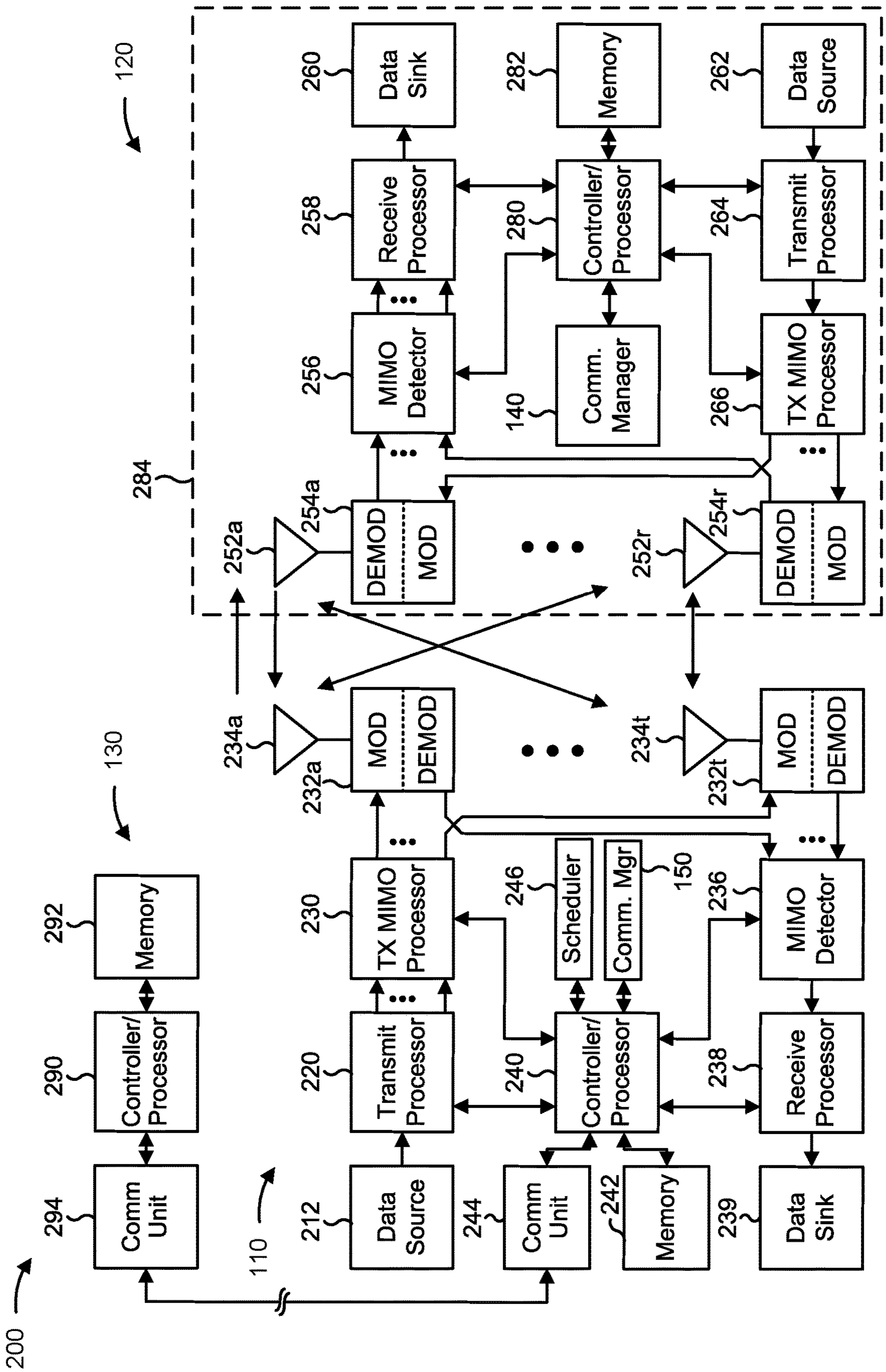

200
130
120
110
284
Comm Unit
294
Controller/ Processor
290
Memory
292
Data Source
212
Transmit Processor
220
TX MIMO Processor
230
MOD
DEMOD
232a
234a
232t
234t
Comm Unit
244
Memory
242
Controller/ Processor
240
Scheduler
246
Comm. Mgr
150
MIMO Detector
236
Receive Processor
238
Data Sink
239
252a
254a
DEMOD
MOD
252r
254r
MIMO Detector
256
Receive Processor
258
Data Sink
260
Comm. Manager
140
Controller/ Processor
280
Memory
282
TX MIMO Processor
266
Transmit Processor
264
Data Source
262

FIG. 2

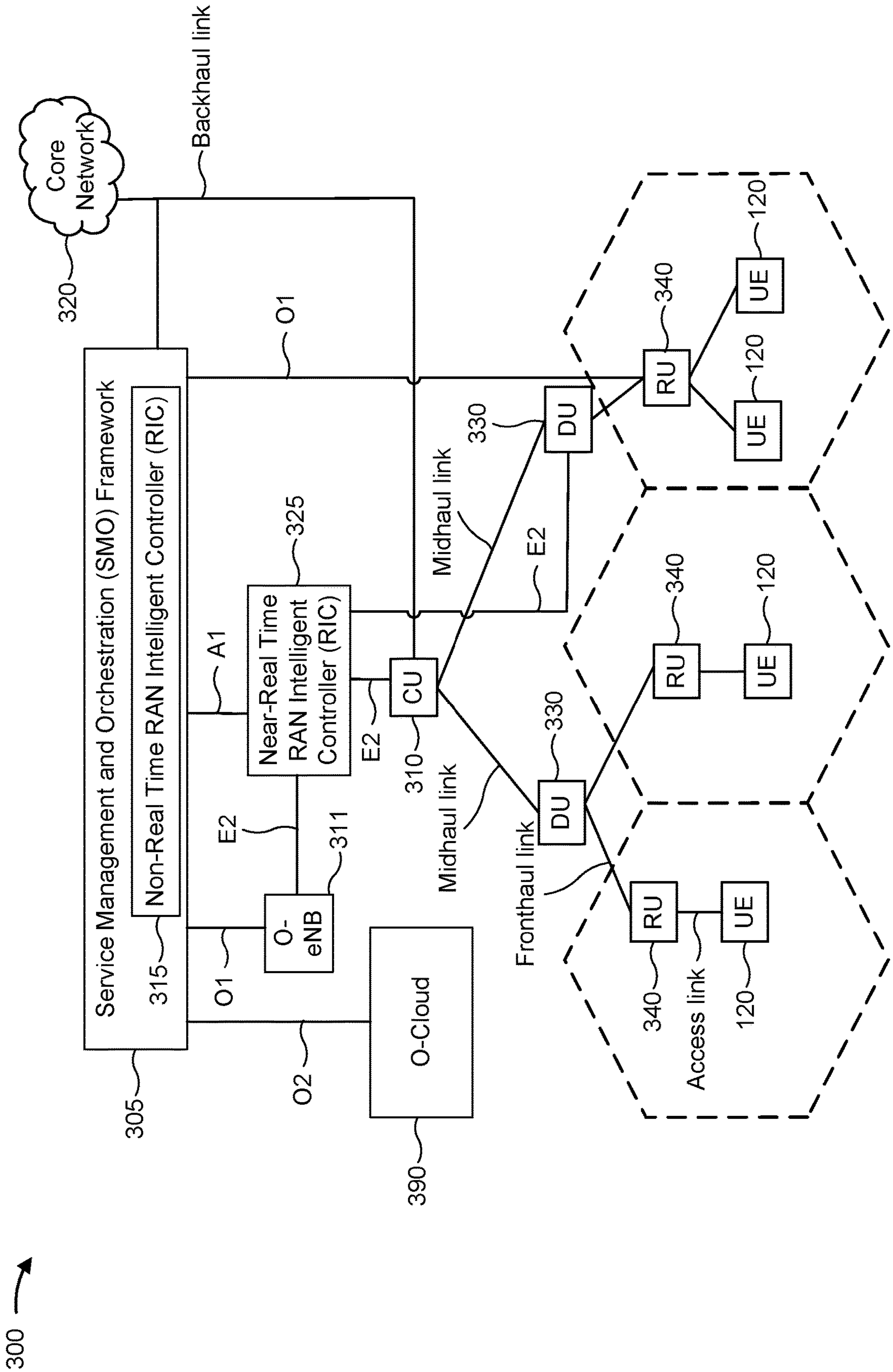

300
Core Network
320
Backhaul link
Service Management and Orchestration (SMO) Framework
Non-Real Time RAN Intelligent Controller (RIC)
305
315
O1
O1
O2
A1
E2
E2
E2
Near-Real Time RAN Intelligent Controller (RIC)
325
O-eNB
311
O-Cloud
390
CU
310
Midhaul link
Midhaul link
DU
DU
330
330
Fronthaul link
RU
RU
RU
340
340
340
UE
UE
UE
UE
UE
120
120
120
120
120
Access link

FIG. 3

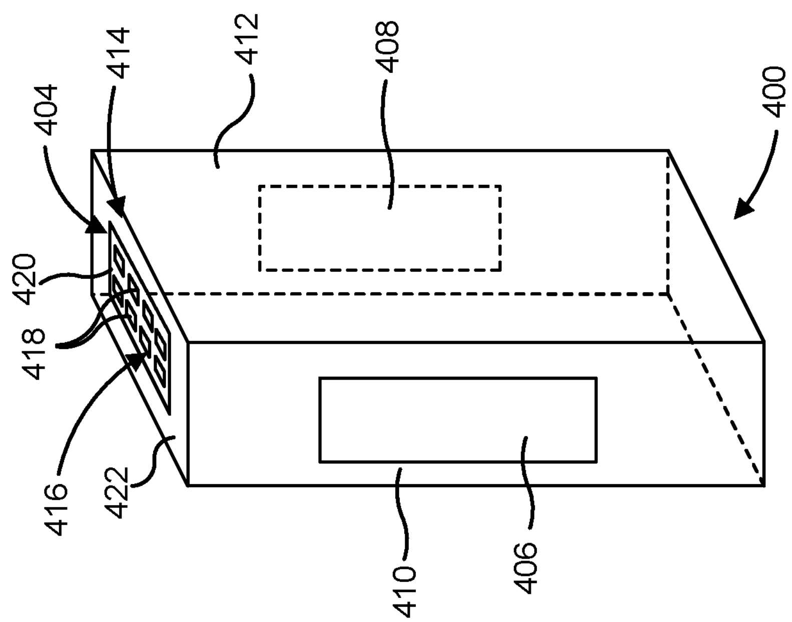


FIG. 4A

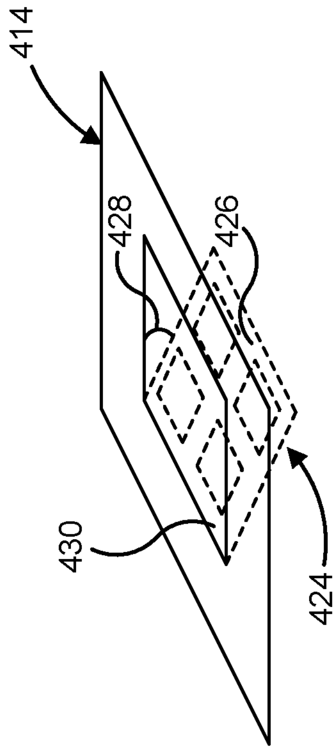


FIG. 4B

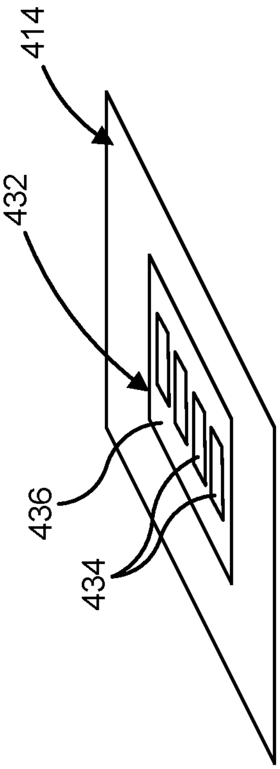


FIG. 4C

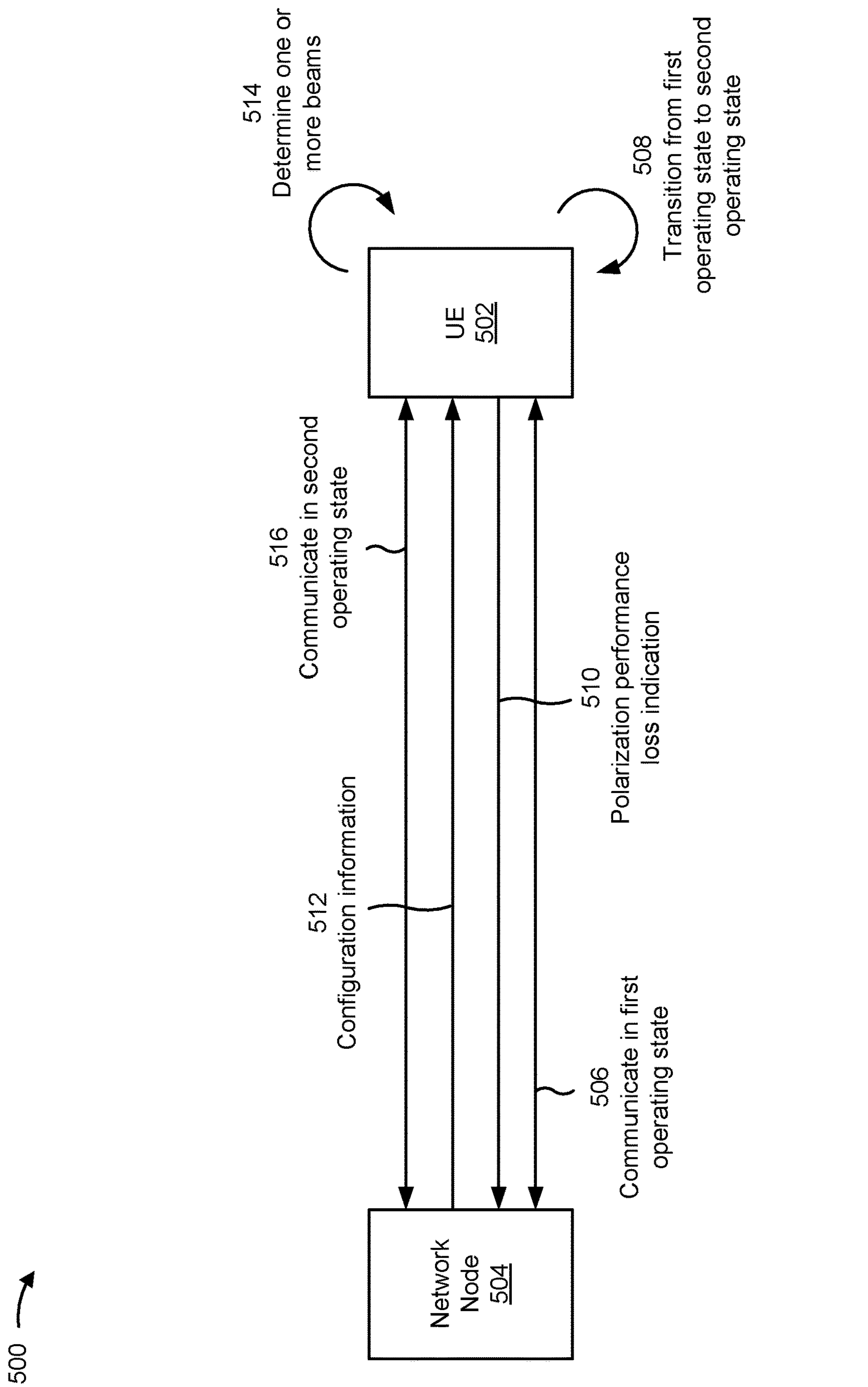

500
Network Node 504
UE 502
506 Communicate in first operating state
508 Transition from first operating state to second operating state
510 Polarization performance loss indication
512 Configuration information
514 Determine one or more beams
516 Communicate in second operating state

FIG. 5

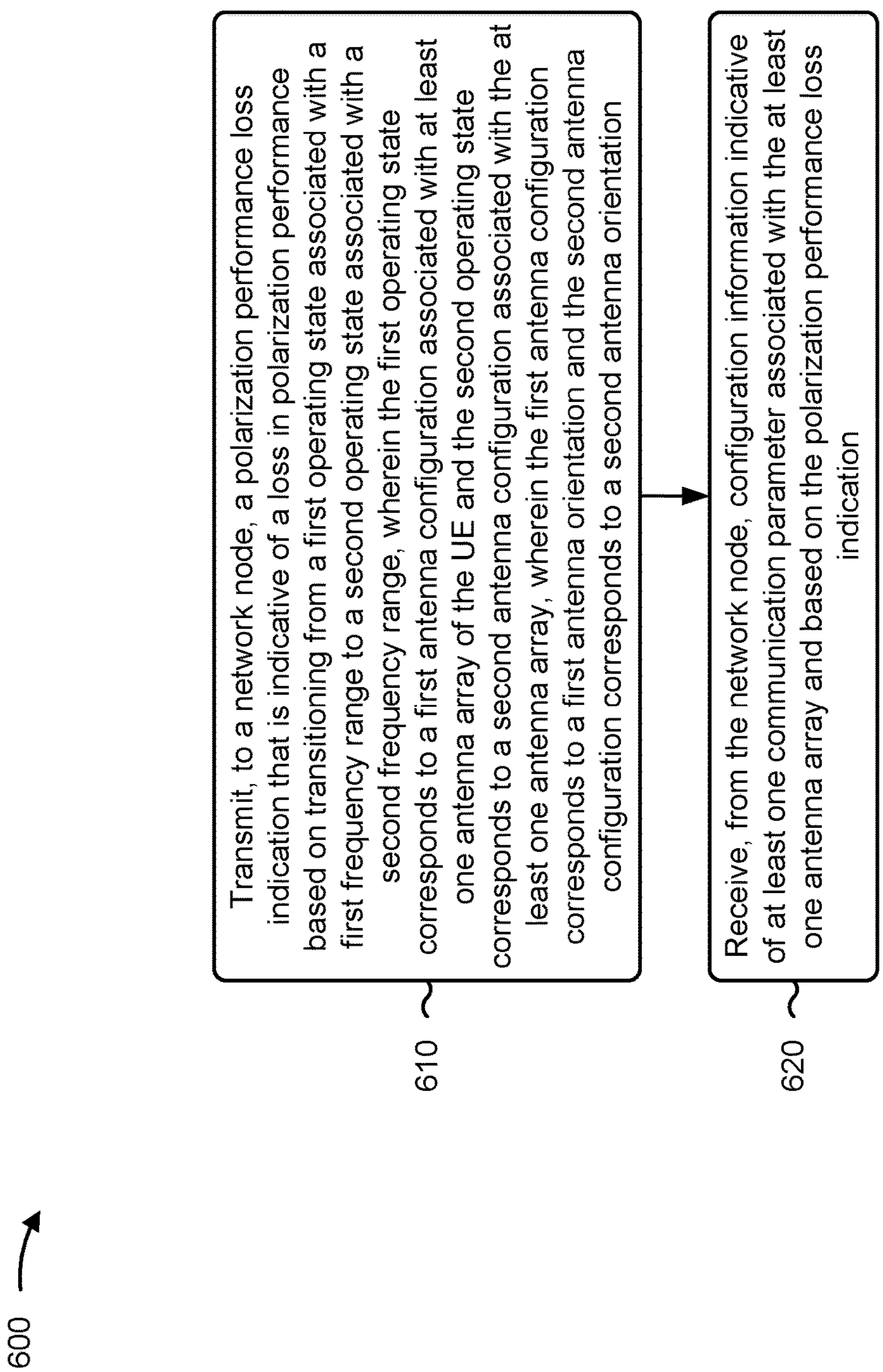

600
610
Transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation
620
Receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication

FIG. 6

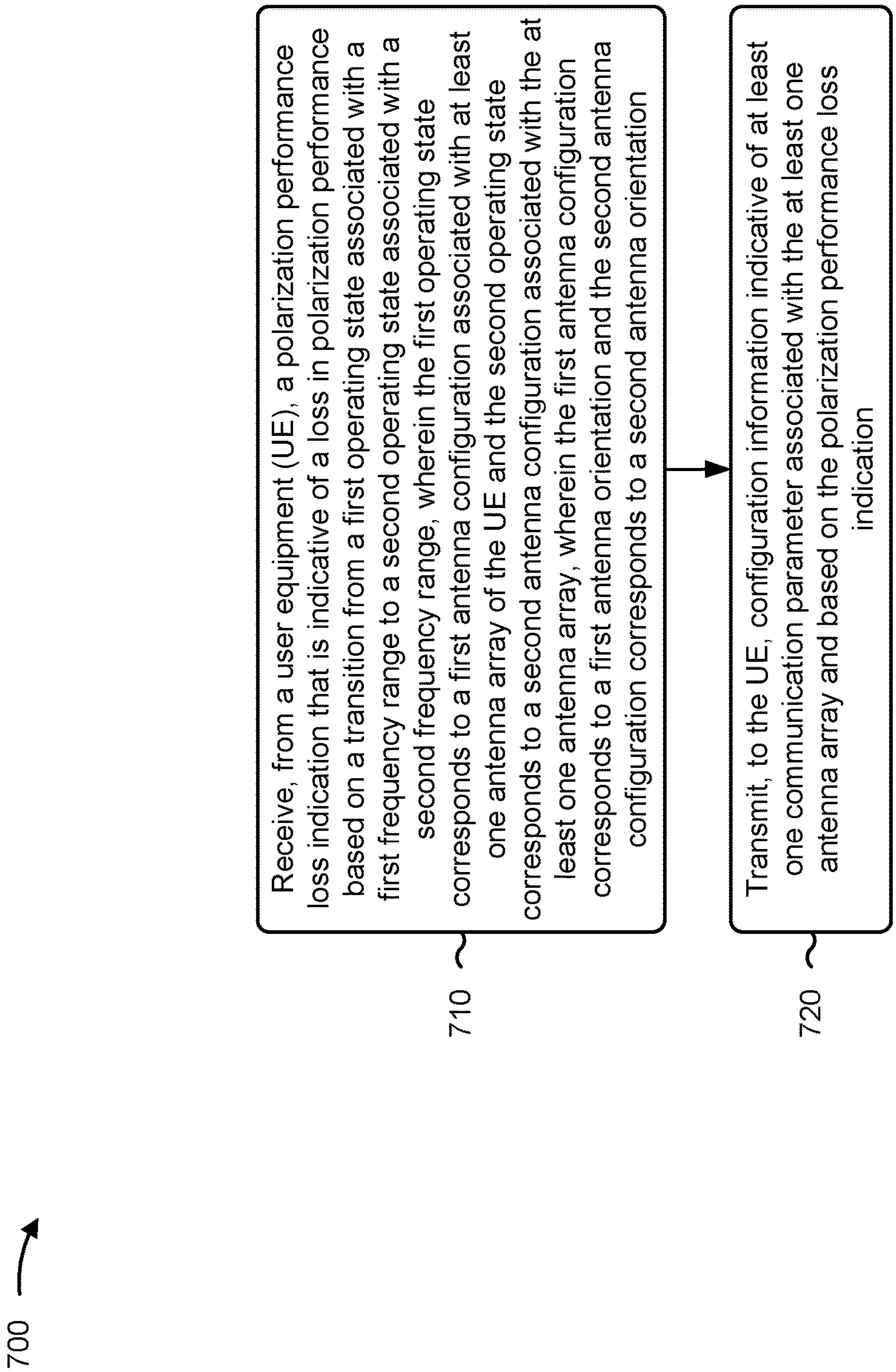

700
710
Receive, from a user equipment (UE), a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation
720
Transmit, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication

FIG. 7

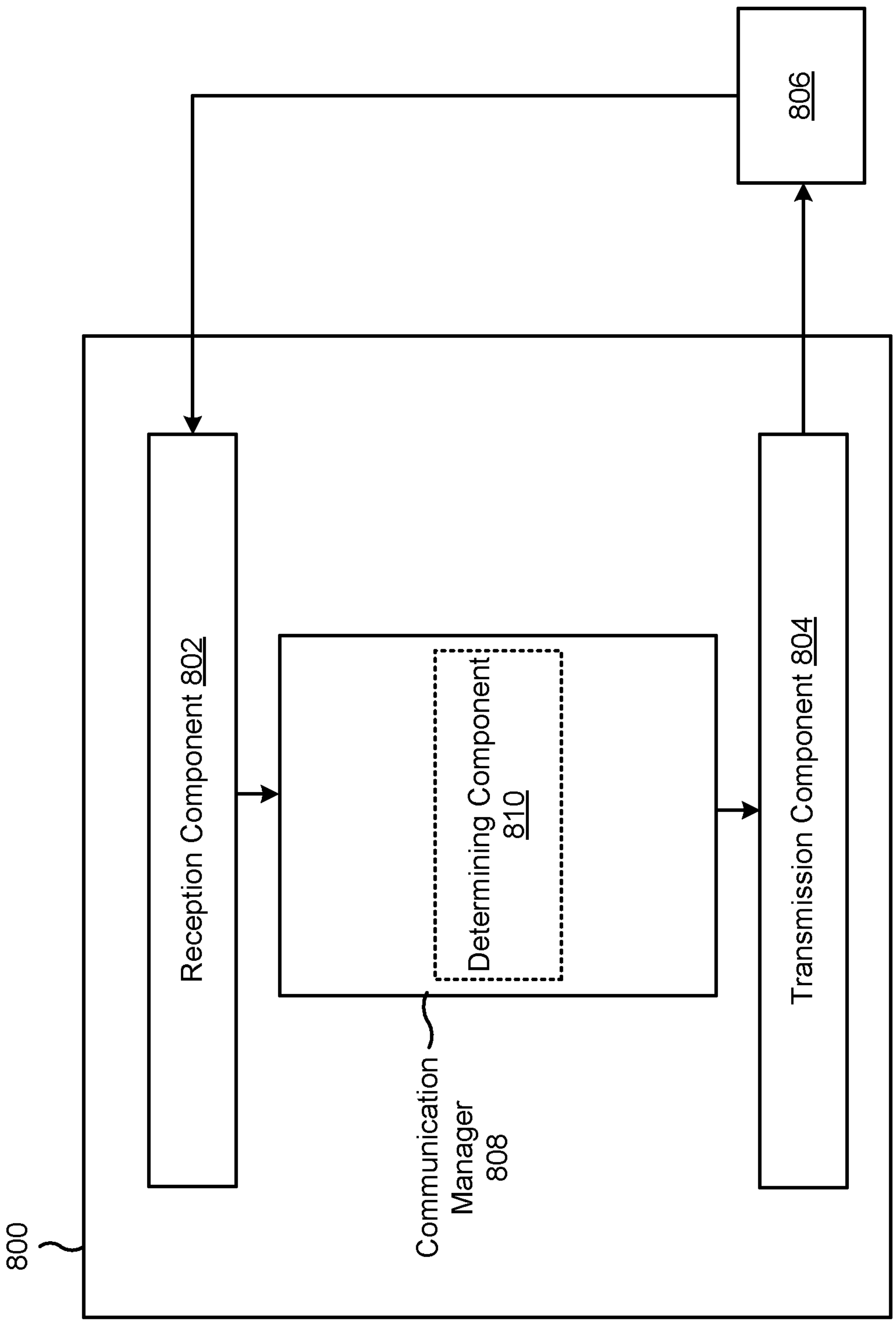

806
Reception Component 802
Determining Component 810
Transmission Component 804
Communication Manager 808
800

FIG. 8

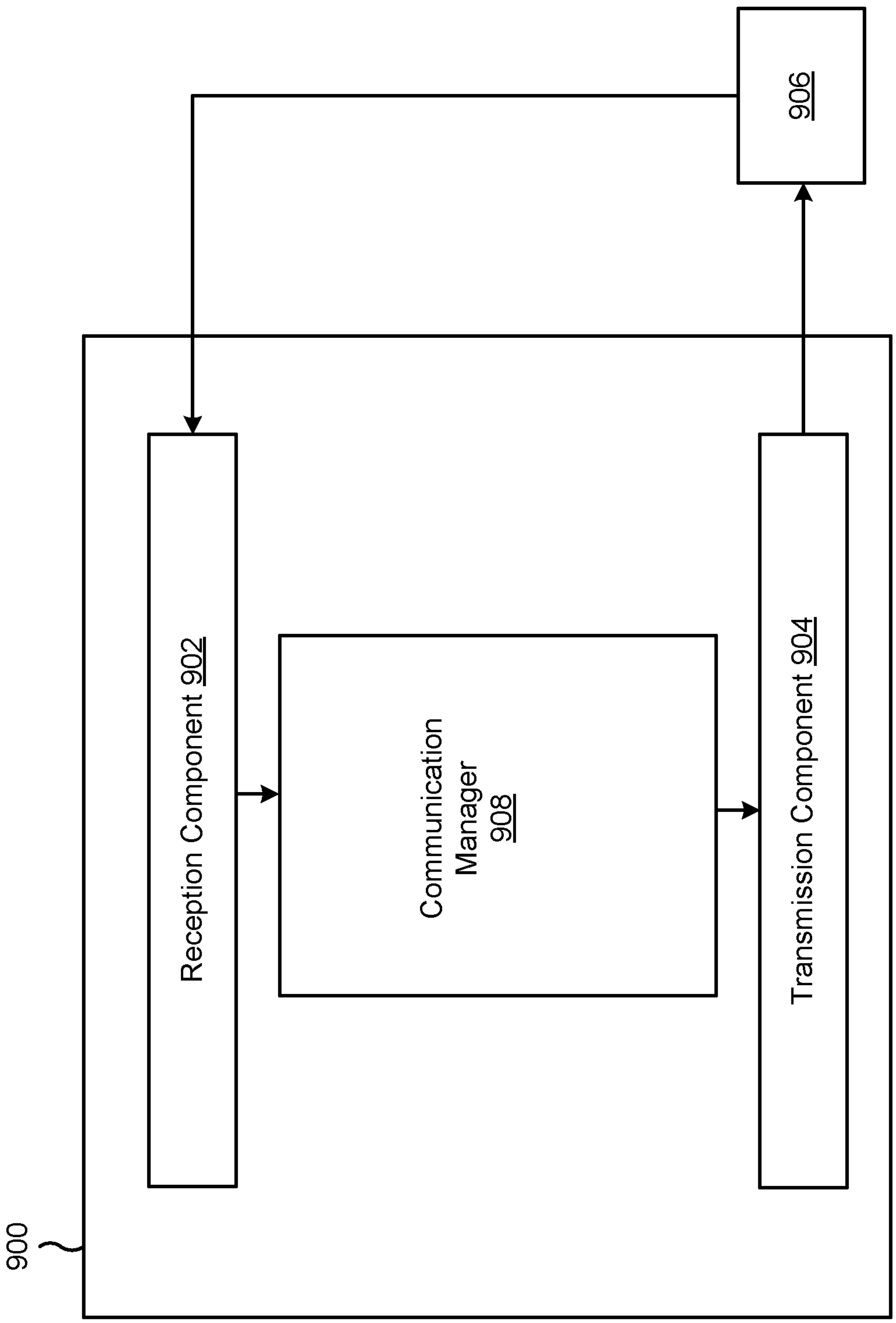

906
Reception Component 902
Communication
Manager
908
Transmission Component 904
900

FIG. 9

MITIGATING POLARIZATION PERFORMANCE LOSS WITH TILTED ANTENNA ARRAYS

FIELD OF THE DISCLOSURE

[0001] Aspects of the present disclosure generally relate to wireless communication and to techniques and apparatuses for mitigating polarization performance loss with tilted antenna arrays.

BACKGROUND

[0002] Wireless communication systems are widely deployed to provide various telecommunication services such as telephony, video, data, messaging, and broadcasts. Typical wireless communication systems may employ multiple-access technologies capable of supporting communication with multiple users by sharing available system resources (e.g., bandwidth, transmit power, or the like). Examples of such multiple-access technologies include code division multiple access (CDMA) systems, time division multiple access (TDMA) systems, frequency division multiple access (FDMA) systems, orthogonal frequency division multiple access (OFDMA) systems, single-carrier frequency division multiple access (SC-FDMA) systems, time division synchronous code division multiple access (TD-SCDMA) systems, and Long Term Evolution (LTE). LTE/LTE-Advanced is a set of enhancements to the Universal Mobile Telecommunications System (UMTS) mobile standard promulgated by the Third Generation Partnership Project (3GPP).

[0003] A wireless network may include one or more network nodes that support communication for wireless communication devices, such as a user equipment (UE) or multiple UEs. A UE may communicate with a network node via downlink communications and uplink communications. "Downlink" (or "DL") refers to a communication link from the network node to the UE, and "uplink" (or "UL") refers to a communication link from the UE to the network node. Some wireless networks may support device-to-device communication, such as via a local link (e.g., a sidelink (SL), a wireless local area network (WLAN) link, and/or a wireless personal area network (WPAN) link, among other examples).

[0004] The above multiple access technologies have been adopted in various telecommunication standards to provide a common protocol that enables different UEs to communicate on a municipal, national, regional, and/or global level. New Radio (NR), which may be referred to as 5G, is a set of enhancements to the LTE mobile standard promulgated by the 3GPP. NR is designed to better support mobile broadband internet access by improving spectral efficiency, lowering costs, improving services, making use of new spectrum, and better integrating with other open standards using orthogonal frequency division multiplexing (OFDM) with a cyclic prefix (CP) (CP-OFDM) on the downlink, using CP-OFDM and/or single-carrier frequency division multiplexing (SC-FDM) (also known as discrete Fourier transform spread OFDM (DFT-s-OFDM)) on the uplink, as well as supporting beamforming, multiple-input multiple-output (MIMO) antenna technology, and carrier aggregation. As the demand for mobile broadband access continues to increase, further improvements in LTE, NR, and other radio access technologies remain useful.

SUMMARY

[0005] Some aspects described herein relate to a user equipment (UE) for wireless communication. The user equipment may include a memory and one or more processors coupled to the memory. The one or more processors may be configured to transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. An antenna configuration may refer to an antenna array geometry, an antenna array size, an inter-antenna element spacing, a spatial arrangement of one or more antenna elements of an antenna array (e.g., an arrangement on an active surface of the antenna array), a position of an antenna array, and/or an orientation of an antenna array with respect to one or more components (or one or more orientations of one or more components) of the UE. The one or more processors may be configured to receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0006] Some aspects described herein relate to a network node for wireless communication. The network node may include a memory and one or more processors coupled to the memory. The one or more processors may be configured to receive, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. The one or more processors may be configured to transmit, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0007] Some aspects described herein relate to a method of wireless communication performed by an apparatus of a UE. The method may include transmitting, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna

orientation and the second antenna configuration corresponds to a second antenna orientation. The method may include receiving, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0008] Some aspects described herein relate to a method of wireless communication performed by an apparatus of a network node. The method may include receiving, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. The method may include transmitting, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0009] Some aspects described herein relate to a non-transitory computer-readable medium that stores a set of instructions for wireless communication by a UE. The set of instructions, when executed by one or more processors of the UE, may cause the UE to transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. The set of instructions, when executed by one or more processors of the UE, may cause the UE to receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0010] Some aspects described herein relate to a non-transitory computer-readable medium that stores a set of instructions for wireless communication by a network node. The set of instructions, when executed by one or more processors of the network node, may cause the network node to receive, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. The set of instructions, when executed by one or more processors of the network node, may cause the network node to transmit, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0011] Some aspects described herein relate to an apparatus for wireless communication. The apparatus may include means for transmitting, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the apparatus and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. The apparatus may include means for receiving, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0012] Some aspects described herein relate to an apparatus for wireless communication. The apparatus may include means for receiving, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation. The apparatus may include means for transmitting, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0013] Aspects generally include a method, apparatus, system, computer program product, non-transitory computer-readable medium, user equipment, base station, network entity, network node, wireless communication device, and/or processing system as substantially described herein with reference to and as illustrated by the drawings and specification.

[0014] The foregoing has outlined rather broadly the features and technical advantages of examples according to the disclosure in order that the detailed description that follows may be better understood. Additional features and advantages will be described hereinafter. The conception and specific examples disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present disclosure. Such equivalent constructions do not depart from the scope of the appended claims. Characteristics of the concepts disclosed herein, both their organization and method of operation, together with associated advantages, will be better understood from the following description when considered in connection with the accompanying figures. Each of the figures is provided for the purposes of illustration and description, and not as a definition of the limits of the claims.

[0015] While aspects are described in the present disclosure by illustration to some examples, those skilled in the art will understand that such aspects may be implemented in many different arrangements and scenarios. Techniques described herein may be implemented using different platform types, devices, systems, shapes, sizes, and/or packaging arrangements. For example, some aspects may be implemented via integrated chip embodiments or other non-module-component based devices (e.g., end-user devices, vehicles, communication devices, computing devices, industrial equipment, retail/purchasing devices, medical devices, and/or artificial intelligence devices). Aspects may be implemented in chip-level components, modular components, non-modular components, non-chip-level components, device-level components, and/or system-level components. Devices incorporating described aspects and features may include additional components and features for implementation and practice of claimed and described aspects. For example, transmission and reception of wireless signals may include one or more components for analog and digital purposes (e.g., hardware components including antennas, radio frequency (RF) chains, power amplifiers, modulators, buffers, processors, interleavers, adders, and/or summers). It is intended that aspects described herein may be practiced in a wide variety of devices, components, systems, distributed arrangements, and/or end-user devices of varying size, shape, and constitution.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] So that the above-recited features of the present disclosure can be understood in detail, a more particular description, briefly summarized above, may be had by reference to aspects, some of which are illustrated in the appended drawings. It is to be noted, however, that the appended drawings illustrate only certain typical aspects of this disclosure and are therefore not to be considered limiting of its scope, for the description may admit to other equally effective aspects. The same reference numbers in different drawings may identify the same or similar elements.

[0017] FIG. **1** is a diagram illustrating an example of a wireless network, in accordance with the present disclosure.

[0018] FIG. **2** is a diagram illustrating an example of a network node in communication with a user equipment (UE) in a wireless network, in accordance with the present disclosure.

[0019] FIG. **3** is a diagram illustrating an example disaggregated base station architecture, in accordance with the present disclosure.

[0020] FIGS. **4**A-**4**C illustrate an example of a UE configured to operate in a first operating state and a second operating state, in accordance with the present disclosure.

[0021] FIG. **5** is a diagram illustrating an example associated with mitigating polarization performance loss with tilted antenna arrays, in accordance with the present disclosure.

[0022] FIG. **6** is a diagram illustrating an example process performed, for example, by a UE in accordance with the present disclosure.

[0023] FIG. **7** is a diagram illustrating an example process performed, for example, by a network node, in accordance with the present disclosure.

[0024] FIG. **8** is a diagram of an example apparatus for wireless communication, in accordance with the present disclosure.

[0025] FIG. **9** is a diagram of an example apparatus for wireless communication, in accordance with the present disclosure.

DETAILED DESCRIPTION

[0026] Various aspects of the disclosure are described more fully hereinafter with reference to the accompanying drawings. This disclosure may, however, be embodied in many different forms and should not be construed as limited to any specific structure or function presented throughout this disclosure. Rather, these aspects are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the disclosure to those skilled in the art. One skilled in the art should appreciate that the scope of the disclosure is intended to cover any aspect of the disclosure disclosed herein, whether implemented independently of or combined with any other aspect of the disclosure. For example, an apparatus may be implemented or a method may be practiced using any number of the aspects set forth herein. In addition, the scope of the disclosure is intended to cover such an apparatus or method which is practiced using other structure, functionality, or structure and functionality in addition to or other than the various aspects of the disclosure set forth herein. It should be understood that any aspect of the disclosure disclosed herein may be embodied by one or more elements of a claim.

[0027] Aspects and examples generally include a method, apparatus, network node, system, computer program product, non-transitory computer-readable medium, user equipment, base station, wireless communication device, and/or processing system as described or substantially described herein with reference to and as illustrated by the drawings and specification.

[0028] This disclosure may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present disclosure. Such equivalent constructions do not depart from the scope of the appended claims. Characteristics of the concepts disclosed herein, both their organization and method of operation, together with associated advantages, are better understood from the following description when considered in connection with the accompanying figures. Each of the figures is provided for the purposes of illustration and description, and not as a definition of the limits of the claims.

[0029] While aspects are described in the present disclosure by illustration to some examples, such aspects may be implemented in many different arrangements and scenarios. Techniques described herein may be implemented using different platform types, devices, systems, shapes, sizes, and/or packaging arrangements. For example, some aspects may be implemented via integrated chip embodiments or other non-module-component-based devices (e.g., end-user devices, vehicles, communication devices, computing devices, industrial equipment, retail/purchasing devices, medical devices, and/or artificial intelligence devices). Aspects may be implemented in chip-level components, modular components, non-modular components, non-chip-level components, device-level components, and/or system-level components. Devices incorporating described aspects and features may include additional components and features for implementation and practice of claimed and described aspects. For example, transmission and reception of wireless signals may include one or more components for analog and digital purposes (e.g., hardware components including antennas, radio frequency (RF) chains, power amplifiers, modulators, buffers, processors, interleavers, adders, and/or summers). Aspects described herein may be practiced in a wide variety of devices, components, systems, distributed arrangements, and/or end-user devices of varying size, shape, and constitution.

[0030] Several aspects of telecommunication systems will now be presented with reference to various apparatuses and techniques. These apparatuses and techniques will be described in the following detailed description and illustrated in the accompanying drawings by various blocks, modules, components, circuits, steps, processes, algorithms, or the like (collectively referred to as "elements"). These elements may be implemented using hardware, software, or combinations thereof. Whether such elements are implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system.

[0031] While aspects may be described herein using terminology commonly associated with a 5G or New Radio (NR) radio access technology (RAT), aspects of the present disclosure can be applied to other RATs, such as a 3G RAT, a 4G RAT, and/or a RAT subsequent to 5G (e.g., 5G Advanced or 6G).

[0032] FIG. **1** is a diagram illustrating an example of a wireless network **100**, in accordance with the present disclosure. The wireless network **100** may be or may include elements of a 5G (e.g., NR) network and/or a 4G (e.g., Long Term Evolution (LTE)) network, among other examples. The wireless network **100** may include one or more network nodes **110** (shown as a network node **110***a*, a network node **110***b*, a network node **110***c*, and a network node **110***d*), a user equipment (UE) **120** or multiple UEs **120** (shown as a UE **120***a*, a UE **120***b*, a UE **120***c*, a UE **120***d*, and a UE **120***e*), and/or other entities. A network node **110** is a network node that communicates with UEs **120**. As shown, a network node **110** may include one or more network nodes. For example, a network node **110** may be an aggregated network node, meaning that the aggregated network node is configured to utilize a radio protocol stack that is physically or logically integrated within a single radio access network (RAN) node (e.g., within a single device or unit). As another example, a network node **110** may be a disaggregated network node (sometimes referred to as a disaggregated base station), meaning that the network node **110** is configured to utilize a protocol stack that is physically or logically distributed among two or more nodes (such as one or more central units (CUs), one or more distributed units (DUs), or one or more radio units (RUs)).

[0033] In some examples, a network node **110** is or includes a network node that communicates with UEs **120** via a radio access link, such as an RU. In some examples, a network node **110** is or includes a network node that communicates with other network nodes **110** via a fronthaul link or a midhaul link, such as a DU. In some examples, a network node **110** is or includes a network node that communicates with other network nodes **110** via a midhaul link or a core network via a backhaul link, such as a CU. In some examples, a network node **110** (such as an aggregated network node **110** or a disaggregated network node **110**) may include multiple network nodes, such as one or more RUs, one or more CUs, and/or one or more DUs. A network node **110** may include, for example, an NR base station, an LTE base station, a Node B, an eNB (e.g., in 4G), a gNB (e.g., in 5G), an access point, a transmission reception point (TRP), a DU, an RU, a CU, a mobility element of a network, a core network node, a network element, a network equipment, a RAN node, or a combination thereof. In some examples, the network nodes **110** may be interconnected to one another or to one or more other network nodes **110** in the wireless network **100** through various types of fronthaul, midhaul, and/or backhaul interfaces, such as a direct physical connection, an air interface, or a virtual network, using any suitable transport network.

[0034] In some examples, a network node **110** may provide communication coverage for a particular geographic area. In the Third Generation Partnership Project (3GPP), the term "cell" can refer to a coverage area of a network node **110** and/or a network node subsystem serving this coverage area, depending on the context in which the term is used. A network node **110** may provide communication coverage for a macro cell, a pico cell, a femto cell, and/or another type of cell. A macro cell may cover a relatively large geographic area (e.g., several kilometers in radius) and may allow unrestricted access by UEs **120** with service subscriptions. A pico cell may cover a relatively small geographic area and may allow unrestricted access by UEs **120** with service subscriptions. A femto cell may cover a relatively small geographic area (e.g., a home) and may allow restricted access by UEs **120** having association with the femto cell (e.g., UEs **120** in a closed subscriber group (CSG)). A network node **110** for a macro cell may be referred to as a macro network node. A network node **110** for a pico cell may be referred to as a pico network node. A network node **110** for a femto cell may be referred to as a femto network node or an in-home network node. In the example shown in FIG. **1**, the network node **110***a* may be a macro network node for a macro cell **102***a*, the network node **110***b* may be a pico network node for a pico cell **102***b*, and the network node **110***c* may be a femto network node for a femto cell **102***c*. A network node may support one or multiple (e.g., three) cells. In some examples, a cell may not necessarily be stationary, and the geographic area of the cell may move according to the location of a network node **110** that is mobile (e.g., a mobile network node).

[0035] In some aspects, the term "base station" or "network node" may refer to an aggregated base station, a disaggregated base station, an integrated access and backhaul (IAB) node, a relay node, or one or more components thereof. For example, in some aspects, "base station" or "network node" may refer to a CU, a DU, an RU, a Near-Real Time (Near-RT) RAN Intelligent Controller (RIC), or a Non-Real Time (Non-RT) RIC, or a combination thereof. In some aspects, the term "base station" or "network node" may refer to one device configured to perform one or more functions, such as those described herein in connection with the network node **110**. In some aspects, the term "base station" or "network node" may refer to a plurality of devices configured to perform the one or more functions. For example, in some distributed systems, each of a quantity of different devices (which may be located in the same geographic location or in different geographic locations) may be configured to perform at least a portion of a function, or to duplicate performance of at least a portion of the function, and the term "base station" or "network node" may refer to any one or more of those different devices. In some aspects, the term "base station" or "network node" may refer to one or more virtual base stations or one or more virtual base station functions. For example, in some aspects, two or more base station functions may be instantiated on a single device. In some aspects, the term "base station" or "network node" may refer to one of the base station functions and not another. In this way, a single device may include more than one base station.

[0036] The wireless network **100** may include one or more relay stations. A relay station is a network node that can receive a transmission of data from an upstream node (e.g., a network node **110** or a UE **120**) and send a transmission of the data to a downstream node (e.g., a UE **120** or a network node **110**). A relay station may be a UE **120** that can relay transmissions for other UEs **120**. In the example shown in FIG. **1**, the network node **110***d* (e.g., a relay network node) may communicate with the network node **110***a* (e.g., a macro network node) and the UE **120***d* in order to facilitate communication between the network node **110***a* and the UE **120***d*. A network node **110** that relays communications may be referred to as a relay station, a relay base station, a relay network node, a relay node, a relay, or the like.

[0037] The wireless network **100** may be a heterogeneous network that includes network nodes **110** of different types, such as macro network nodes, pico network nodes, femto network nodes, relay network nodes, or the like. These different types of network nodes **110** may have different transmit power levels, different coverage areas, and/or different impacts on interference in the wireless network **100**. For example, macro network nodes may have a high transmit power level (e.g., 5 to 40 watts) whereas pico network nodes, femto network nodes, and relay network nodes may have lower transmit power levels (e.g., 0.1 to 2 watts).

[0038] A network controller **130** may couple to or communicate with a set of network nodes **110** and may provide coordination and control for these network nodes **110**. The network controller **130** may communicate with the network nodes **110** via a backhaul communication link or a midhaul communication link. The network nodes **110** may communicate with one another directly or indirectly via a wireless or wireline backhaul communication link. In some aspects, the network controller **130** may be a CU or a core network device, or may include a CU or a core network device.

[0039] The UEs **120** may be dispersed throughout the wireless network **100**, and each UE **120** may be stationary or mobile. A UE **120** may include, for example, an access terminal, a terminal, a mobile station, and/or a subscriber unit. A UE **120** may be a cellular phone (e.g., a smart phone), a personal digital assistant (PDA), a wireless modem, a wireless communication device, a handheld device, a laptop computer, a cordless phone, a wireless local loop (WLL) station, a tablet, a camera, a gaming device, a netbook, a smartbook, an ultrabook, a medical device, a biometric device, a wearable device (e.g., a smart watch, smart clothing, smart glasses, a smart wristband, smart jewelry (e.g., a smart ring or a smart bracelet)), an entertainment device (e.g., a music device, a video device, and/or a satellite radio), a vehicular component or sensor, a smart meter/sensor, industrial manufacturing equipment, a global positioning system device, a UE function of a network node, and/or any other suitable device that is configured to communicate via a wireless or wired medium.

[0040] Some UEs **120** may be considered machine-type communication (MTC) or evolved or enhanced machine-type communication (eMTC) UEs. An MTC UE and/or an eMTC UE may include, for example, a robot, a drone, a remote device, a sensor, a meter, a monitor, and/or a location tag, that may communicate with a network node, another device (e.g., a remote device), or some other entity. Some UEs **120** may be considered Internet-of-Things (IoT) devices, and/or may be implemented as NB-IoT (narrowband IoT) devices. Some UEs **120** may be considered a Customer Premises Equipment (CPE). A UE **120** may be included inside a housing that houses components of the UE **120**, such as processor components and/or memory components. In some examples, the processor components and the memory components may be coupled together. For example, the processor components (e.g., one or more processors) and the memory components (e.g., a memory) may be operatively coupled, communicatively coupled, electronically coupled, and/or electrically coupled.

[0041] In general, any number of wireless networks **100** may be deployed in a given geographic area. Each wireless network **100** may support a particular RAT and may operate on one or more frequencies. A RAT may be referred to as a radio technology, an air interface, or the like. A frequency may be referred to as a carrier, a frequency channel, or the like. Each frequency may support a single RAT in a given geographic area in order to avoid interference between wireless networks of different RATs. In some cases, NR or 5G RAT networks may be deployed.

[0042] In some examples, two or more UEs **120** (e.g., shown as UE **120***a* and UE **120***e*) may communicate directly using one or more sidelink channels (e.g., without using a network node **110** as an intermediary to communicate with one another). For example, the UEs **120** may communicate using peer-to-peer (P2P) communications, device-to-device (D2D) communications, a vehicle-to-everything (V2X) protocol (e.g., which may include a vehicle-to-vehicle (V2V) protocol, a vehicle-to-infrastructure (V2I) protocol, or a vehicle-to-pedestrian (V2P) protocol), and/or a mesh network. In such examples, a UE **120** may perform scheduling operations, resource selection operations, and/or other operations described elsewhere herein as being performed by the network node **110**.

[0043] Devices of the wireless network **100** may communicate using the electromagnetic spectrum, which may be subdivided by frequency or wavelength into various classes, bands, channels, or the like. For example, devices of the wireless network **100** may communicate using one or more operating bands. In 5G NR, two initial operating bands have been identified as frequency range designations FR1 (410 MHz-7.125 GHz) and FR2-1 (24.25 GHz-52.6 GHz). It should be understood that although a portion of FR1 is greater than 6 GHz, FR1 is often referred to (interchangeably) as a "Sub-6 GHz" band in various documents and articles. A similar nomenclature issue sometimes occurs with regard to FR2-1, which is often referred to (interchangeably) as a "millimeter wave" band in documents and articles, despite being different from the extremely high frequency (EHF) band (30 GHz-300 GHz) which is identified by the International Telecommunications Union (ITU) as a "millimeter wave" band.

[0044] The frequencies between FR1 and FR2 are often referred to as mid-band frequencies. Recent 5G NR studies have identified an operating band for these mid-band frequencies as frequency range designation FR3 (7.125 GHz-24.25 GHz). Frequency bands falling within FR3 may inherit FR1 characteristics and/or FR2-1 characteristics, and thus may effectively extend features of FR1 and/or FR2-1 into mid-band frequencies. In addition, higher frequency bands are currently being explored to extend 5G NR operation beyond 52.6 GHz. For example, three higher operating bands have been identified as frequency range designations FR2-2 (52.6 GHz-71 GHz), FR4 (71 GHz-114.25 GHz), and FR5 (114.25 GHz-300 GHz). Each of these higher frequency bands falls within the EHF band.

[0045] With the above examples in mind, unless specifically stated otherwise, it should be understood that the term "sub-6 GHz" or the like, if used herein, may broadly represent frequencies that may be less than 6 GHz, may be within FR1, or may include mid-band frequencies. Further, unless specifically stated otherwise, it should be understood that the term "millimeter wave" or the like, if used herein, may broadly represent frequencies that may include mid-band frequencies, may be within FR2-1, FR2-2, FR4, FR3, and/or FR5, or may be within the EHF band. It is contemplated that the frequencies included in these operating bands (e.g., FR1, FR2-1, FR2-2, FR3, FR4, and/or FR5) may be modified, and techniques described herein are applicable to those modified frequency ranges.

[0046] In some aspects, the UE **120** may include a communication manager **140**. As described in more detail elsewhere herein, the communication manager **140** may transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication. Additionally, or alternatively, the communication manager **140** may perform one or more other operations described herein.

[0047] In some aspects, the network node **110** may include a communication manager **150**. As described in more detail elsewhere herein, the communication manager **150** may receive, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and transmit, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication. Additionally, or alternatively, the communication manager **150** may perform one or more other operations described herein.

[0048] As indicated above, FIG. **1** is provided as an example. Other examples may differ from what is described with regard to FIG. **1**.

[0049] FIG. **2** is a diagram illustrating an example **200** of a network node **110** in communication with a UE **120** in a wireless network **100**, in accordance with the present disclosure. The network node **110** may be equipped with a set of antennas **234***a* through **234***t*, such as T antennas (T≥1). The UE **120** may be equipped with a set of antennas **252***a* through **252***r*, such as R antennas (R≥1). The network node **110** of example **200** includes one or more radio frequency components, such as antennas **234** and a modem **254**. In some examples, a network node **110** may include an interface, a communication component, or another component that facilitates communication with the UE **120** or another network node. Some network nodes **110** may not include radio frequency components that facilitate direct communication with the UE **120**, such as one or more CUs, or one or more DUs.

[0050] At the network node **110**, a transmit processor **220** may receive data, from a data source **212**, intended for the UE **120** (or a set of UEs **120**). The transmit processor **220** may select one or more modulation and coding schemes (MCSs) for the UE **120** based at least in part on one or more channel quality indicators (CQIs) received from that UE **120**. The network node **110** may process (e.g., encode and modulate) the data for the UE **120** based at least in part on the MC S(s) selected for the UE **120** and may provide data symbols for the UE **120**. The transmit processor **220** may process system information (e.g., for semi-static resource partitioning information (SRPI)) and control information (e.g., CQI requests, grants, and/or upper layer signaling) and provide overhead symbols and control symbols. The transmit processor **220** may generate reference symbols for reference signals (e.g., a cell-specific reference signal (CRS) or a demodulation reference signal (DMRS)) and synchronization signals (e.g., a primary synchronization signal (PSS) or a secondary synchronization signal (SSS)). A transmit (TX) multiple-input multiple-output (MIMO) processor **230** may perform spatial processing (e.g., precoding) on the data symbols, the control symbols, the overhead symbols, and/or the reference symbols, if applicable, and may provide a set of output symbol streams (e.g., T output symbol streams) to a corresponding set of modems **232** (e.g., T modems), shown as modems **232***a* through **232***t*. For example, each output symbol stream may be provided to a modulator component (shown as MOD) of a modem **232**. Each modem **232** may use a respective modulator component to process a respective output symbol stream (e.g., for OFDM) to obtain an output sample stream. Each modem **232** may further use a respective modulator component to process (e.g., convert to analog, amplify, filter, and/or upconvert) the output sample stream to obtain a downlink signal. The modems **232***a* through **232***t* may transmit a set of downlink signals (e.g., T downlink signals) via a corresponding set of antennas **234** (e.g., T antennas), shown as antennas **234***a* through **234***t*.

[0051] At the UE **120**, a set of antennas **252** (shown as antennas **252***a* through **252***r*) may receive the downlink signals from the network node **110** and/or other network nodes **110** and may provide a set of received signals (e.g., R received signals) to a set of modems **254** (e.g., R modems), shown as modems **254***a* through **254***r*. For example, each received signal may be provided to a demodulator component (shown as DEMOD) of a modem **254**. Each modem **254** may use a respective demodulator component to condition (e.g., filter, amplify, downconvert, and/or digitize) a received signal to obtain input samples. Each modem **254** may use a demodulator component to further process the input samples (e.g., for OFDM) to obtain received symbols. A MIMO detector **256** may obtain received symbols from the modems **254**, may perform MIMO detection on the received symbols if applicable, and may provide detected symbols. A receive processor **258** may process (e.g., demodulate and decode) the detected symbols, may provide decoded data for the UE **120** to a data sink **260**, and may provide decoded control information and system information to a controller/processor **280**. The term "controller/processor" may refer to one or more controllers, one or more processors, or a combination thereof. A channel processor may determine a reference signal received power (RSRP) parameter, a received signal strength indicator (RSSI) parameter, a reference signal received quality (RSRQ) parameter, and/or a CQI parameter, among other examples. In some examples, one or more components of the UE **120** may be included in a housing **284**.

[0052] The network controller **130** may include a communication unit **294**, a controller/processor **290**, and a memory **292**. The network controller **130** may include, for example, one or more devices in a core network. The network controller **130** may communicate with the network node **110** via the communication unit **294**.

[0053] One or more antennas (e.g., antennas **234***a* through **234***t* and/or antennas **252***a* through **252***r*) may include, or may be included within, one or more antenna panels, one or more antenna groups, one or more sets of antenna elements, and/or one or more antenna arrays, among other examples. An antenna panel, an antenna group, a set of antenna elements, and/or an antenna array may include one or more antenna elements (within a single housing or multiple housings), a set of coplanar antenna elements, a set of non-coplanar antenna elements, and/or one or more antenna elements coupled to one or more transmission and/or reception components, such as one or more components of FIG. **2**.

[0054] Each of the antenna elements may include one or more sub-elements for radiating or receiving radio frequency signals. For example, a single antenna element may include a first sub-element cross-polarized with a second sub-element that can be used to independently transmit cross-polarized signals. The antenna elements may include patch antennas, dipole antennas, or other types of antennas arranged in a linear pattern, a two-dimensional pattern, or another pattern. A spacing between antenna elements may be such that signals with a desired wavelength transmitted separately by the antenna elements may interact or interfere (e.g., to form a desired beam). For example, given an expected range of wavelengths or frequencies, the spacing may provide a quarter wavelength, half wavelength, or other fraction of a wavelength of spacing between neighboring antenna elements to allow for interaction or interference of signals transmitted by the separate antenna elements within that expected range.

[0055] Antenna elements and/or sub-elements may be used to generate beams. "Beam" may refer to a directional transmission such as a wireless signal that is transmitted in a direction of a receiving device. A beam may include a directional signal, a direction associated with a signal, a set of directional resources associated with a signal (e.g., angle of arrival, horizontal direction, vertical direction), and/or a set of parameters that indicate one or more aspects of a directional signal, a direction associated with a signal, and/or a set of directional resources associated with a signal.

[0056] As indicated above, antenna elements and/or sub-elements may be used to generate beams. For example, antenna elements may be individually selected or deselected for transmission of a signal (or signals) by controlling an amplitude of one or more corresponding amplifiers. Beamforming includes generation of a beam using multiple signals on different antenna elements, where one or more, or all, of the multiple signals are shifted in phase relative to each other. The formed beam may carry physical or higher layer reference signals or information. As each signal of the multiple signals is radiated from a respective antenna element, the radiated signals interact, interfere (constructive and destructive interference), and amplify each other to form a resulting beam. The shape (such as the amplitude, width, and/or presence of side lobes) and the direction (such as an angle of the beam relative to a surface of an antenna array) can be dynamically controlled by modifying the phase shifts or phase offsets of the multiple signals relative to each other.

[0057] Beamforming may be used for communications between a UE and a base station, such as for millimeter wave communications and/or the like. In such a case, the base station may provide the UE with a configuration of transmission configuration indicator (TCI) states that respectively indicate beams that may be used by the UE, such as for receiving a physical downlink shared channel (PDSCH). The base station may indicate an activated TCI state to the UE, which the UE may use to select a beam for receiving the PDSCH.

[0058] A beam indication may be, or include, a TCI state information element, a beam identifier (ID), spatial relation information, a TCI state ID, a closed loop index, a panel ID, a TRP ID, and/or a sounding reference signal (SRS) set ID, among other examples. A TCI state information element (referred to as a TCI state herein) may indicate information associated with a beam such as a downlink beam. For example, the TCI state information element may indicate a TCI state identification (e.g., a tci-StateID), a quasi-co-location (QCL) type (e.g., a qcl-Type1, qcl-Type2, qcl-TypeA, qcl-TypeB, qcl-TypeC, qcl-TypeD, and/or the like), a cell identification (e.g., a ServCellIndex), a bandwidth part identification (bwp-Id), a reference signal identification such as a CSI-RS (e.g., an NZP-CSI-RS-ResourceId, an SSB-Index, and/or the like), and/or the like. Spatial relation information may similarly indicate information associated with an uplink beam.

[0059] The beam indication may be a joint or separate downlink (DL)/uplink (UL) beam indication in a unified TCI framework. In some cases, the network may support layer 1 (L1)-based beam indication using at least UE-specific (unicast) downlink control information (DCI) to indicate joint or separate DL/UL beam indications from active TCI states. In some cases, existing DCI formats 1_1 and/or 1_2 may be reused for beam indication. The network may include a support mechanism for a UE to acknowledge successful decoding of a beam indication. For example, the acknowledgment/negative acknowledgment (ACK/NACK) of the PDSCH scheduled by the DCI carrying the beam indication may be also used as an ACK for the DCI.

[0060] Beam indications may be provided for carrier aggregation (CA) scenarios. In a unified TCI framework, information the network may support common TCI state ID update and activation to provide common QCL and/or common UL transmission spatial filter or filters across a set of configured component carriers (CCs). This type of beam indication may apply to intra-band CA, as well as to joint DL/UL and separate DL/UL beam indications. The common TCI state ID may imply that one reference signal (RS) determined according to the TCI state(s) indicated by a common TCI state ID is used to provide QCL Type-D indication and to determine UL transmission spatial filters across the set of configured CCs.

[0061] On the uplink, at the UE **120**, a transmit processor **264** may receive and process data from a data source **262** and control information (e.g., for reports that include RSRP, RSSI, RSRQ, and/or CQI) from the controller/processor **280**. The transmit processor **264** may generate reference symbols for one or more reference signals. The symbols from the transmit processor **264** may be precoded by a TX MIMO processor **266** if applicable, further processed by the modems **254** (e.g., for DFT-s-OFDM or CP-OFDM), and transmitted to the network node **110**. In some examples, the modem **254** of the UE **120** may include a modulator and a demodulator. In some examples, the UE **120** includes a transceiver. The transceiver may include any combination of the antenna(s) **252**, the modem(s) **254**, the MIMO detector **256**, the receive processor **258**, the transmit processor **264**, and/or the TX MIMO processor **266**. The transceiver may be used by a processor (e.g., the controller/processor **280**) and the memory **282** to perform aspects of any of the methods described herein (e.g., with reference to FIGS. **5-9**).

[0062] At the network node **110**, the uplink signals from UE **120** and/or other UEs may be received by the antennas **234**, processed by the modem **232** (e.g., a demodulator component, shown as DEMOD, of the modem **232**), detected by a MIMO detector **236** if applicable, and further processed by a receive processor **238** to obtain decoded data and control information sent by the UE **120**. The receive processor **238** may provide the decoded data to a data sink **239** and provide the decoded control information to the controller/processor **240**. The network node **110** may include a communication unit **244** and may communicate with the network controller **130** via the communication unit **244**. The network node **110** may include a scheduler **246** to schedule one or more UEs **120** for downlink and/or uplink communications. In some examples, the modem **232** of the network node **110** may include a modulator and a demodulator. In some examples, the network node **110** includes a transceiver. The transceiver may include any combination of the antenna(s) **234**, the modem(s) **232**, the MIMO detector **236**, the receive processor **238**, the transmit processor **220**, and/or the TX MIMO processor **230**. The transceiver may be used by a processor (e.g., the controller/processor **240**) and the memory **242** to perform aspects of any of the methods described herein (e.g., with reference to FIGS. **5-9**).

[0063] In some aspects, the controller/processor **280** may be a component of a processing system. A processing system may generally be a system or a series of machines or components that receives inputs and processes the inputs to produce a set of outputs (which may be passed to other systems or components of, for example, the UE **120**). For example, a processing system of the UE **120** may be a system that includes the various other components or subcomponents of the UE **120**.

[0064] The processing system of the UE **120** may interface with one or more other components of the UE **120**, may process information received from one or more other components (such as inputs or signals), or may output information to one or more other components. For example, a chip or modem of the UE **120** may include a processing system, a first interface to receive or obtain information, and a second interface to output, transmit, or provide information. In some examples, the first interface may be an interface between the processing system of the chip or modem and a receiver, such that the UE **120** may receive information or signal inputs, and the information may be passed to the processing system. In some examples, the second interface may be an interface between the processing system of the chip or modem and a transmitter, such that the UE **120** may transmit information output from the chip or modem. A person having ordinary skill in the art will readily recognize that the second interface also may obtain or receive information or signal inputs, and the first interface also may output, transmit, or provide information.

[0065] In some aspects, the controller/processor **240** may be a component of a processing system. A processing system may generally be a system or a series of machines or components that receives inputs and processes the inputs to produce a set of outputs (which may be passed to other systems or components of, for example, the network node **110**). For example, a processing system of the network node **110** may be a system that includes the various other components or subcomponents of the network node **110**.

[0066] The processing system of the network node **110** may interface with one or more other components of the network node **110**, may process information received from one or more other components (such as inputs or signals), or may output information to one or more other components. For example, a chip or modem of the network node **110** may include a processing system, a first interface to receive or obtain information, and a second interface to output, transmit, or provide information. In some examples, the first interface may be an interface between the processing system of the chip or modem and a receiver, such that the network node **110** may receive information or signal inputs, and the information may be passed to the processing system. In some examples, the second interface may be an interface between the processing system of the chip or modem and a transmitter, such that the network node **110** may transmit information output from the chip or modem. A person having ordinary skill in the art will readily recognize that the second interface also may obtain or receive information or signal inputs, and the first interface also may output, transmit, or provide information.

[0067] The controller/processor **240** of the network node **110**, the controller/processor **280** of the UE **120**, and/or any other component(s) of FIG. **2** may perform one or more techniques associated with mitigating polarization performance loss with tilted antenna arrays, as described in more detail elsewhere herein. For example, the controller/processor **240** of the network node **110**, the controller/processor **280** of the UE **120**, and/or any other component(s) of FIG. **2** may perform or direct operations of, for example, process **600** of FIG. **6**, process **700** of FIG. **7**, and/or other processes as described herein. The memory **242** and the memory **282** may store data and program codes for the network node **110** and the UE **120**, respectively. In some examples, the memory **242** and/or the memory **282** may include a non-transitory computer-readable medium storing one or more instructions (e.g., code and/or program code) for wireless communication. For example, the one or more instructions, when executed (e.g., directly, or after compiling, converting, and/or interpreting) by one or more processors of the network node **110** and/or the UE **120**, may cause the one or more processors, the UE **120**, and/or the network node **110** to perform or direct operations of, for example, process **600** of FIG. **6**, process **700** of FIG. **7**, and/or other processes as described herein. In some examples, executing instructions may include running the instructions, converting the instructions, compiling the instructions, and/or interpreting the instructions, among other examples.

[0068] In some aspects, the UE **120** includes means for transmitting, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and/or means for receiving, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication. The means for the UE to perform operations described herein may include, for example, one or more of communication manager **140**, antenna **252**, modem **254**, MIMO detector **256**, receive processor **258**, transmit processor **264**, TX MIMO processor **266**, controller/processor **280**, or memory **282**.

[0069] In some aspects, the network node **110** includes means for receiving, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and/or means for transmitting, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication. The means for the network node to perform operations described herein may include, for example, one or more of communication manager **150**, transmit processor **220**, TX MIMO processor **230**, modem **232**, antenna **234**, MIMO detector **236**, receive processor **238**, controller/processor **240**, memory **242**, or scheduler **246**.

[0070] While blocks in FIG. **2** are illustrated as distinct components, the functions described above with respect to the blocks may be implemented in a single hardware, software, or combination component or in various combinations of components. For example, the functions described with respect to the transmit processor **264**, the receive processor **258**, and/or the TX MIMO processor **266** may be performed by or under the control of the controller/processor **280**.

[0071] As indicated above, FIG. **2** is provided as an example. Other examples may differ from what is described with regard to FIG. **2**.

[0072] Deployment of communication systems, such as 5G NR systems, may be arranged in multiple manners with various components or constituent parts. In a 5G NR system, or network, a network node, a network entity, a mobility element of a network, a RAN node, a core network node, a network element, a base station, or a network equipment may be implemented in an aggregated or disaggregated architecture. For example, a base station (such as a Node B (NB), an evolved NB (eNB), an NR BS, a 5G NB, an access point (AP), a TRP, or a cell, among other examples), or one or more units (or one or more components) performing base station functionality, may be implemented as an aggregated base station (also known as a standalone base station or a monolithic base station) or a disaggregated base station. "Network entity" or "network node" may refer to a disaggregated base station, or to one or more units of a disaggregated base station (such as one or more CUs, one or more DUs, one or more RUs, or a combination thereof).

[0073] An aggregated base station (e.g., an aggregated network node) may be configured to utilize a radio protocol stack that is physically or logically integrated within a single RAN node (e.g., within a single device or unit). A disaggregated base station (e.g., a disaggregated network node) may be configured to utilize a protocol stack that is physically or logically distributed among two or more units (such as one or more CUs, one or more DUs, or one or more RUs). In some examples, a CU may be implemented within a network node, and one or more DUs may be co-located with the CU, or alternatively, may be geographically or virtually distributed throughout one or multiple other network nodes. The DUs may be implemented to communicate with one or more RUs. Each of the CU, DU and RU also can be implemented as virtual units, such as a virtual central unit (VCU), a virtual distributed unit (VDU), or a virtual radio unit (VRU), among other examples.

[0074] Base station-type operation or network design may consider aggregation characteristics of base station functionality. For example, disaggregated base stations may be utilized in an IAB network, an open radio access network (O-RAN (such as the network configuration sponsored by the O-RAN Alliance)), or a virtualized radio access network (vRAN, also known as a cloud radio access network (C-RAN)) to facilitate scaling of communication systems by separating base station functionality into one or more units that can be individually deployed. A disaggregated base station may include functionality implemented across two or more units at various physical locations, as well as functionality implemented for at least one unit virtually, which can enable flexibility in network design. The various units of the disaggregated base station can be configured for wired or wireless communication with at least one other unit of the disaggregated base station.

[0075] FIG. **3** is a diagram illustrating an example disaggregated base station architecture **300**, in accordance with the present disclosure. The disaggregated base station architecture **300** may include a CU **310** that can communicate directly with a core network **320** via a backhaul link, or indirectly with the core network **320** through one or more disaggregated control units (such as a Near-RT RIC **325** via an E2 link, or a Non-RT RIC **315** associated with a Service Management and Orchestration (SMO) Framework **305**, or both). A CU **310** may communicate with one or more DUs **330** via respective midhaul links, such as through F1 interfaces. Each of the DUs **330** may communicate with one or more RUs **340** via respective fronthaul links. Each of the RUs **340** may communicate with one or more UEs **120** via respective RF access links. In some implementations, a UE **120** may be simultaneously served by multiple RUs **340**.

[0076] Each of the units, including the CUs **310**, the DUs **330**, the RUs **340**, as well as the Near-RT RICs **325**, the Non-RT RICs **315**, and the SMO Framework **305**, may include one or more interfaces or be coupled with one or more interfaces configured to receive or transmit signals, data, or information (collectively, signals) via a wired or wireless transmission medium. Each of the units, or an associated processor or controller providing instructions to one or multiple communication interfaces of the respective unit, can be configured to communicate with one or more of the other units via the transmission medium. In some examples, each of the units can include a wired interface, configured to receive or transmit signals over a wired transmission medium to one or more of the other units, and a wireless interface, which may include a receiver, a transmitter or transceiver (such as an RF transceiver), configured to receive or transmit signals, or both, over a wireless transmission medium to one or more of the other units.

[0077] In some aspects, the CU **310** may host one or more higher layer control functions. Such control functions can include radio resource control (RRC) functions, packet data convergence protocol (PDCP) functions, or service data adaptation protocol (SDAP) functions, among other examples. Each control function can be implemented with an interface configured to communicate signals with other control functions hosted by the CU **310**. The CU **310** may be configured to handle user plane functionality (for example, Central Unit—User Plane (CU-UP) functionality), control plane functionality (for example, Central Unit—Control Plane (CU-CP) functionality), or a combination thereof. In some implementations, the CU **310** can be logically split into one or more CU-UP units and one or more CU-CP units. A CU-UP unit can communicate bidirectionally with a CU-CP unit via an interface, such as the E1 interface when implemented in an O-RAN configuration. The CU **310** can be implemented to communicate with a DU **330**, as necessary, for network control and signaling.

[0078] Each DU **330** may correspond to a logical unit that includes one or more base station functions to control the operation of one or more RUs **340**. In some aspects, the DU **330** may host one or more of a radio link control (RLC) layer, a MAC layer, and one or more high physical (PHY) layers depending, at least in part, on a functional split, such as a functional split defined by the 3GPP. In some aspects, the one or more high PHY layers may be implemented by one or more modules for forward error correction (FEC) encoding and decoding, scrambling, and modulation and demodulation, among other examples. In some aspects, the DU **330** may further host one or more low PHY layers, such as implemented by one or more modules for a fast Fourier transform (FFT), an inverse FFT (iFFT), digital beamforming, or physical random access channel (PRACH) extraction and filtering, among other examples. Each layer (which also may be referred to as a module) can be implemented with an interface configured to communicate signals with other layers (and modules) hosted by the DU **330**, or with the control functions hosted by the CU **310**.

[0079] Each RU **340** may implement lower-layer functionality. In some deployments, an RU **340**, controlled by a DU **330**, may correspond to a logical node that hosts RF processing functions or low-PHY layer functions, such as performing an FFT, performing an iFFT, digital beamforming, or PRACH extraction and filtering, among other examples, based on a functional split (for example, a functional split defined by the 3GPP), such as a lower layer functional split. In such an architecture, each RU **340** can be operated to handle over the air (OTA) communication with one or more UEs **120**. In some implementations, real-time and non-real-time aspects of control and user plane communication with the RU(s) **340** can be controlled by the corresponding DU **330**. In some scenarios, this configuration can enable each DU **330** and the CU **310** to be implemented in a cloud-based RAN architecture, such as a vRAN architecture.

[0080] The SMO Framework **305** may be configured to support RAN deployment and provisioning of non-virtualized and virtualized network elements. For non-virtualized network elements, the SMO Framework **305** may be configured to support the deployment of dedicated physical resources for RAN coverage requirements, which may be managed via an operations and maintenance interface (such as an O1 interface). For virtualized network elements, the SMO Framework **305** may be configured to interact with a cloud computing platform (such as an open cloud (O-Cloud) platform **390**) to perform network element life cycle management (such as to instantiate virtualized network elements) via a cloud computing platform interface (such as an O2 interface). Such virtualized network elements can include, but are not limited to, CUs **310**, DUs **330**, RUs **340**, non-RT RICs **315**, and Near-RT RICs **325**. In some implementations, the SMO Framework **305** can communicate with a hardware aspect of a 4G RAN, such as an open eNB (O-eNB) **311**, via an O1 interface. Additionally, in some implementations, the SMO Framework **305** can communicate directly with each of one or more RUs **340** via a respective O1 interface. The SMO Framework **305** also may include a Non-RT RIC **315** configured to support functionality of the SMO Framework **305**.

[0081] The Non-RT RIC **315** may be configured to include a logical function that enables non-real-time control and optimization of RAN elements and resources, Artificial Intelligence/Machine Learning (AI/ML) workflows including model training and updates, or policy-based guidance of applications/features in the Near-RT RIC **325**. The Non-RT RIC **315** may be coupled to or communicate with (such as via an A1 interface) the Near-RT RIC **325**. The Near-RT RIC **325** may be configured to include a logical function that enables near-real-time control and optimization of RAN elements and resources via data collection and actions over an interface (such as via an E2 interface) connecting one or more CUs **310**, one or more DUs **330**, or both, as well as an O-eNB, with the Near-RT RIC **325**.

[0082] In some implementations, to generate AI/ML models to be deployed in the Near-RT RIC **325**, the Non-RT RIC **315** may receive parameters or external enrichment information from external servers. Such information may be utilized by the Near-RT RIC **325** and may be received at the SMO Framework **305** or the Non-RT RIC **315** from non-network data sources or from network functions. In some examples, the Non-RT RIC **315** or the Near-RT RIC **325** may be configured to tune RAN behavior or performance. For example, the Non-RT RIC **315** may monitor long-term trends and patterns for performance and employ AI/ML models to perform corrective actions through the SMO Framework **305** (such as reconfiguration via an O1 interface) or via creation of RAN management policies (such as A1 interface policies).

[0083] As indicated above, FIG. **3** is provided as an example. Other examples may differ from what is described with regard to FIG. **3**.

[0084] FIGS. **4A**-**4C** illustrate an example of a UE **402** configured to operate in a first operating state and a second operating state, in accordance with the present disclosure. In some aspects, the UE **402** may be, be similar to, include, or be included in, the UE **120** depicted in FIGS. **1**-**3**.

[0085] As shown in FIG. **4**A, the UE **402** may include antenna modules **404**, **406**, and **408**. Each antenna module **404**, **406**, and **408** may include one or more radio frequency integrated circuits (RFICs) and may be configured to provide spherical coverage for frequency ranges of, for example, FR2 and above. As shown, two antenna modules **406** and **408** may be disposed along two long edges **410** and **412**, respectively. The antenna module **404** may be disposed along a short edge **414**. As shown, the antenna module **404** may include a dual-polarized 4×1 antenna array **416** including four antenna elements **418** (where each antenna element is represented as two boxes, one for each polarization) disposed on an active surface **420**. In some aspects, the antenna modules **404**, **406**, and/or **408** each may include an N×1 antenna array (e.g., where N=4, 5, or 6).

[0086] In some cases, the UE **402** may be configured to transition from a first operating state corresponding to a first antenna configuration to a second operating state corresponding to a second antenna configuration. An antenna configuration may refer to an antenna array geometry, an antenna array size, an inter-antenna element spacing, a position of an antenna array, and/or an orientation of an antenna array with respect to one or more components (or one or more orientations of one or more components) of the UE. However, in some cases, a network node communicating with the UE **402** may be unaware of a loss in polarization performance as a result of the transition and, as a result, the network node may not appropriately configure transmission parameters and/or beams, thereby negatively impacting UE and/or network performance.

[0087] Some aspects may provide for a UE transitioning between operating states associated with antenna configurations and indicating the transition to a network node to facilitate configuration. In some aspects, an antenna element **418** may be separated from an adjacent antenna element by one half of a wavelength (λ/2). Thus, for example, at 24-30 GHz (with λ being 10-12.5 mm), antenna elements **418** may be placed 5-6.25 mm apart from adjacent antenna elements **418**. The form factor of the antenna modules **404**, **406**, and **408**, and the UE **402** may facilitate orientation of the respective antenna arrays parallel to the corresponding surfaces of the UE **402**. For example, as shown, the active surface **420** of the antenna array **416** may be oriented parallel to a surface **422** corresponding to the edge **414**. In some aspects, the active surface **420** may be oriented such that an angle between the active surface **420** and the surface **422** of the UE **402** is within a surface threshold. This orientation may be referred to as a first antenna orientation and may be associated with a first antenna configuration.

[0088] In some aspects, for example, the size of a wavelength may be so large that an N×1 array cannot be disposed parallel to a surface of the UE **402**. For example, in FR3 (for example, at 15 GHz), λ is 20 mm, which can result in an inability to effectively fit a dual-polarized antenna array along an edge of the UE **402**. Thus, as shown in FIG. **4**B, a tilted array **424** may be placed in the UE **402**, allowing for additional surface area of the active surface **426** of the tilted array **424**. In this way, for example, a 2×2 antenna array (or other arrangement) may be implemented. The tilted antenna array **424** may correspond to a second antenna configuration. In some aspects, in the second antenna configuration, an angle **428** between the first antenna orientation and the second antenna orientation (e.g., between an active surface **426** of the antenna array **424** and an active surface **430** associated with the first antenna configuration) may exceed an angle threshold.

[0089] In some aspects, as shown in FIG. **4**C, in the second antenna configuration, one dimension of the N×1 array may be reduced to result in a smaller antenna array **432** that fits within the form factor of the UE **402**. This reduction may result in a loss of dual-polarization performance, as only one polarization **434** of each antenna may lead to expected performance in terms of antenna radiation response. In the illustrated second antenna configuration of FIG. **4**C, the active surface **436** may be oriented similar to the first antenna orientation (e.g., such that an angle between the first antenna orientation and the second antenna orientation is within an angle threshold). In this way, in some aspects, the antenna array **432** may be placed along an edge of the UE **402**.

[0090] In some aspects, the UE **402** may be configured to transition between the first antenna configuration and the second antenna configuration based on switching from one active antenna module to another active antenna module and/or mechanically adjusting the orientation (e.g., using a positioning motor that is operated electrically using an internal sensor) of an antenna module. The UE **402** may provide an indication of a loss of polarization performance resulting from the transition. The indication may be used by the network to facilitate configuring the UE **402** for communications associated with the antenna configuration (and, thus, operating state) into which the UE **402** has transitioned. In this way, some aspects may facilitate more efficient communications in various frequency ranges and may facilitate switching between frequency ranges, thereby improving UE and/or network flexibility and performance.

[0091] As indicated above, FIG. **4** is provided as an illustrative example. Other examples may differ from what is described with regard to FIG. **4**.

[0092] FIG. **5** is a diagram illustrating an example **500** associated with mitigating polarization performance loss with tilted antenna arrays, in accordance with the present disclosure. As shown in FIG. **5**, a UE **502** and a network node **504** may communicate with one another. The UE **502** may be, be similar to, include, or be included in, the UE **402** depicted in FIG. **4** and/or the UE **120** depicted in FIGS. **1**-**3**. For example, the UE **502** may include at least one antenna array. The UE may be configured to operate in a first operating state associated with a first frequency range and in a second operating state associated with a second frequency range, as described herein in connection with FIG. **4**. The network node **504** may be, be similar to, include, or be included in, the network node **110** depicted in FIGS. **1** and **2** and/or one or more components of the disaggregated base station **300** depicted in FIG. **3**.

[0093] As shown by reference number **506**, the UE **502** may communicate (e.g., with the network node **504** and/or one or more additional network nodes and/or UEs) in a first operating state. In some aspects, the first operating state may be associated with a first frequency range (e.g., FR2-1 or FR2-2). The first operating state may correspond to a first antenna configuration associated with at least one antenna array of the UE **502**. The first antenna configuration may correspond to a first antenna orientation. In some aspects, for example, the first antenna orientation may correspond to an antenna array having an active surface that is parallel to, or within a surface threshold angle of, a surface of the UE **502**.

[0094] As shown by reference number **508**, the UE **502** may transition from the first operating state to a second operating state. The second operating state may be associated with a second frequency range (e.g., some part or the whole of FR3 or some parts of FR1). The second operating state may correspond to a second antenna configuration associated with the at least one antenna array. The second antenna configuration may correspond to a second antenna orientation such that an angle between the first antenna orientation and the second antenna orientation is within an angle threshold where the angle threshold can be network configured. For example, in some aspects, the first antenna orientation may be parallel to the second antenna orientation. In some aspects, an angle between the first antenna orientation and the second antenna orientation may exceed an angle threshold.

[0095] As shown by reference number **510**, the UE **502** may transmit, and the network node **504** may receive, a polarization performance loss indication. In some aspects, the polarization performance loss indication may be indicative of a loss in polarization performance based on a transition from the first operating state to the second operating state. In some aspects, the loss of polarization performance associated with the at least one antenna array may correspond to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

[0096] As shown by reference number **512**, the network node **504** may transmit, and the UE **502** may receive, the configuration information corresponding to the antenna arrays at the UE **502**. The configuration information may be indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication. The at least one communication parameter may be indicative of at least one of a first set of digital precoders associated with dual-polarized transmissions corresponding to first frequency range and a second set of digital precoders associated with the second frequency range. The at least one communication parameter may include a data rate achieved at the UE **502**. In some aspects, the at least one communication parameter may include at least one of a resource allocation associated with a single port or two ports. The resource allocation may correspond to at least one of a sounding reference signal (SRS) or a channel state information-reference signal (CSI-RS).

[0097] As shown by reference number **514**, the UE **502** may determine one or more beams corresponding to the second frequency range. For example, in some aspects, the UE **502** may determine the one or more beams based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

[0098] As shown by reference number **516**, the UE **502** may communicate (e.g., with the network node **504**) in the second operating state. For example, in some aspects, the UE **502** may communicate in the second operating state based on the one or more determined beams.

[0099] As indicated above, FIG. **5** is provided as an example. Other examples may differ from what is described with respect to FIG. **5**.

[0100] FIG. **6** is a diagram illustrating an example process **600** performed, for example, by a UE in accordance with the present disclosure. Example process **600** is an example where the UE (e.g., UE **502**) performs operations associated with mitigating polarization performance loss with tilted antenna arrays.

[0101] As shown in FIG. **6**, in some aspects, process **600** may include transmitting, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation (block **610**). For example, the UE (e.g., using communication manager **808** and/or transmission component **804**, depicted in FIG. **8**) may transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation, as described above.

[0102] As further shown in FIG. 6, in some aspects, process 600 may include receiving, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication (block 620). For example, the UE (e.g., using communication manager 808 and/or reception component 802, depicted in FIG. 8) may receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication, as described above.

[0103] Process 600 may include additional aspects, such as any single aspect or any combination of aspects described below and/or in connection with one or more other processes described elsewhere herein.

[0104] In a first aspect, an angle between the first antenna orientation and the second antenna orientation is within an angle threshold. In a second aspect, alone or in combination with the first aspect, the first antenna orientation is parallel to the second antenna orientation. In a third aspect, an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

[0105] In a fourth aspect, alone or in combination with one or more of the first through third aspects, an angle between the first antenna orientation and a surface of the UE is within a surface threshold. In a fifth aspect, alone or in combination with one or more of the first through fourth aspects, process 600 includes determining one or more beams corresponding to the second frequency range based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation. In a sixth aspect, alone or in combination with one or more of the first through fifth aspects, the loss of polarization performance associated with the at least one antenna array corresponds to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

[0106] In a seventh aspect, alone or in combination with one or more of the first through sixth aspects, the at least one communication parameter is indicative of at least one of a first set of digital precoders associated with dual-polarized transmissions corresponding to first frequency range and a second set of digital precoders associated with the second frequency range. In an eighth aspect, alone or in combination with one or more of the first through seventh aspects, the at least one communication parameter comprises a data rate achieved at the UE. In a ninth aspect, alone or in combination with one or more of the first through eighth aspects, the at least one communication parameter comprises at least one of a resource allocation associated with a single port or two ports, the resource allocation corresponding to at least one of an SRS or a CSI-RS.

[0107] Although FIG. 6 shows example blocks of process 600, in some aspects, process 600 may include additional blocks, fewer blocks, different blocks, or differently arranged blocks than those depicted in FIG. 6. Additionally, or alternatively, two or more of the blocks of process 600 may be performed in parallel.

[0108] FIG. 7 is a diagram illustrating an example process 700 performed, for example, by a network node, in accordance with the present disclosure. Example process 700 is an example where the network node (e.g., network node 504) performs operations associated with mitigating polarization performance loss with tilted antenna arrays.

[0109] As shown in FIG. 7, in some aspects, process 700 may include receiving, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation (block 710). For example, the network node (e.g., using communication manager 908 and/or reception component 902, depicted in FIG. 9) may receive, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation, as described above.

[0110] As further shown in FIG. 7, in some aspects, process 700 may include transmitting, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication (block 720). For example, the network node (e.g., using communication manager 908 and/or transmission component 904, depicted in FIG. 9) may transmit, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication, as described above.

[0111] Process 700 may include additional aspects, such as any single aspect or any combination of aspects described below and/or in connection with one or more other processes described elsewhere herein.

[0112] In a first aspect, an angle between the first antenna orientation and the second antenna orientation is within an angle threshold. In a second aspect, alone or in combination with the first aspect, the first antenna orientation is parallel to the second antenna orientation. In a third aspect, an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

[0113] In a fourth aspect, alone or in combination with one or more of the first through third aspects, an angle between the first antenna orientation and a surface of the UE is within a surface threshold. In a fifth aspect, alone or in combination with one or more of the first through fourth aspects, one or more beams corresponding to the second frequency range are based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

[0114] In a sixth aspect, alone or in combination with one or more of the first through fifth aspects, the loss of polarization performance associated with the at least one antenna array corresponds to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

[0115] In a seventh aspect, alone or in combination with one or more of the first through sixth aspects, the at least one communication parameter is indicative of at least one of a first set of digital precoders associated with dual-polarized transmissions corresponding to first frequency range and a second set of digital precoders associated with the second frequency range. In an eighth aspect, alone or in combination with one or more of the first through seventh aspects, the at least one communication parameter comprises a data rate achieved at the UE. In a ninth aspect, alone or in combination with one or more of the first through eighth aspects, the at least one communication parameter comprises at least one of a resource allocation associated with a single port or two ports, the resource allocation corresponding to at least one of an SRS or a CSI-RS.

[0116] Although FIG. **7** shows example blocks of process **700**, in some aspects, process **700** may include additional blocks, fewer blocks, different blocks, or differently arranged blocks than those depicted in FIG. **7**. Additionally, or alternatively, two or more of the blocks of process **700** may be performed in parallel.

[0117] FIG. **8** is a diagram of an example apparatus **800** for wireless communication, in accordance with the present disclosure. The apparatus **800** may be a UE, or a UE may include the apparatus **800**. In some aspects, the apparatus **800** includes a reception component **802** and a transmission component **804**, which may be in communication with one another (for example, via one or more buses and/or one or more other components). As shown, the apparatus **800** may communicate with another apparatus **806** (such as a UE, a base station, or another wireless communication device) using the reception component **802** and the transmission component **804**. As further shown, the apparatus **800** may include the communication manager **808**. The communication manager **808** may include a determination component **810**.

[0118] In some aspects, the apparatus **800** may be configured to perform one or more operations described herein in connection with FIG. **5**. Additionally, or alternatively, the apparatus **800** may be configured to perform one or more processes described herein, such as process **600** of FIG. **6**. In some aspects, the apparatus **800** and/or one or more components shown in FIG. **8** may include one or more components of the UE described in connection with FIG. **2**. Additionally, or alternatively, one or more components shown in FIG. **8** may be implemented within one or more components described in connection with FIG. **2**. Additionally, or alternatively, one or more components of the set of components may be implemented at least in part as software stored in a memory. For example, a component (or a portion of a component) may be implemented as instructions or code stored in a non-transitory computer-readable medium and executable by a controller or a processor to perform the functions or operations of the component.

[0119] The reception component **802** may receive communications, such as reference signals, control information, data communications, or a combination thereof, from the apparatus **806**. The reception component **802** may provide received communications to one or more other components of the apparatus **800**. In some aspects, the reception component **802** may perform signal processing on the received communications (such as filtering, amplification, demodulation, analog-to-digital conversion, demultiplexing, deinterleaving, de-mapping, equalization, interference cancellation, or decoding, among other examples), and may provide the processed signals to the one or more other components of the apparatus **800**. In some aspects, the reception component **802** may include one or more antennas, a modem, a demodulator, a MIMO detector, a receive processor, a controller/processor, a memory, or a combination thereof, of the UE described in connection with FIG. **2**.

[0120] The transmission component **804** may transmit communications, such as reference signals, control information, data communications, or a combination thereof, to the apparatus **806**. In some aspects, one or more other components of the apparatus **800** may generate communications and may provide the generated communications to the transmission component **804** for transmission to the apparatus **806**. In some aspects, the transmission component **804** may perform signal processing on the generated communications (such as filtering, amplification, modulation, digital-to-analog conversion, multiplexing, interleaving, mapping, or encoding, among other examples), and may transmit the processed signals to the apparatus **806**. In some aspects, the transmission component **804** may include one or more antennas, a modem, a modulator, a transmit MIMO processor, a transmit processor, a controller/processor, a memory, or a combination thereof, of the UE described in connection with FIG. **2**. In some aspects, the transmission component **804** may be co-located with the reception component **802** in a transceiver.

[0121] In some examples, means for transmitting, outputting, or sending (or means for outputting for transmission) may include one or more antennas, a modulator, a transmit MIMO processor, a transmit processor, or a combination thereof, of the UE described above in connection with FIG. **2**.

[0122] In some examples, means for receiving (or means for obtaining) may include one or more antennas, a demodulator, a MIMO detector, a receive processor, or a combination thereof, of the UE described above in connection with FIG. **2**.

[0123] In some cases, rather than actually transmitting, for example, signals and/or data, a device may have an interface to output signals and/or data for transmission (a means for outputting). For example, a processor may output signals and/or data, via a bus interface, to an RF front end for transmission. Similarly, rather than actually receiving signals and/or data, a device may have an interface to obtain the signals and/or data received from another device (a means for obtaining). For example, a processor may obtain (or receive) the signals and/or data, via a bus interface, from an

RF front end for reception. In various aspects, an RF front end may include various components, including transmit and receive processors, transmit and receive MIMO processors, modulators, demodulators, and the like, such as depicted in the examples in FIG. **2**.

[0124] In some examples, means for determining may include various processing system components, such as a receive processor, a transmit processor, a controller/processor, a memory, or a combination thereof, of the UE described above in connection with FIG. **2**.

[0125] The communication manager **808** and/or the transmission component **804** may transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation.

[0126] In some aspects, the communication manager **808** may include one or more antennas, a modem, a controller/processor, a memory, or a combination thereof, of the UE described in connection with FIG. **2**. In some aspects, the communication manager **808** may include the reception component **802** and/or the transmission component **804**. In some aspects, the communication manager **808** may be, be similar to, include, or be included in, the communication manager **140** depicted in FIGS. **1** and **2**.

[0127] The communication manager **808** and/or the reception component **802** may receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0128] The communication manager **808** and/or the determination component **810** may determine one or more beams corresponding to the second frequency range based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation. In some aspects, the determination component **810** may include one or more antennas, a modem, a controller/processor, a memory, or a combination thereof, of the UE described in connection with FIG. **2**. In some aspects, the determination component **810** may include the reception component **802** and/or the transmission component **804**. In some aspects, the determination component **810** may be, be similar to, include, or be included in, the communication manager **140** depicted in FIGS. **1** and **2**.

[0129] The number and arrangement of components shown in FIG. **8** are provided as an example. In practice, there may be additional components, fewer components, different components, or differently arranged components than those shown in FIG. **8**. Furthermore, two or more components shown in FIG. **8** may be implemented within a single component, or a single component shown in FIG. **8** may be implemented as multiple, distributed components. Additionally, or alternatively, a set of (one or more) components shown in FIG. **8** may perform one or more functions described as being performed by another set of components shown in FIG. **8**.

[0130] FIG. **9** is a diagram of an example apparatus **900** for wireless communication, in accordance with the present disclosure. The apparatus **900** may be a network node, or a network node may include the apparatus **900**. In some aspects, the apparatus **900** includes a reception component **902** and a transmission component **904**, which may be in communication with one another (for example, via one or more buses and/or one or more other components). As shown, the apparatus **900** may communicate with another apparatus **906** (such as a UE, a base station, or another wireless communication device) using the reception component **902** and the transmission component **904**. As further shown, the apparatus **900** may include a communication manager **908**.

[0131] In some aspects, the apparatus **900** may be configured to perform one or more operations described herein in connection with FIG. **5**. Additionally, or alternatively, the apparatus **900** may be configured to perform one or more processes described herein, such as process **700** of FIG. **7**. In some aspects, the apparatus **900** and/or one or more components shown in FIG. **9** may include one or more components of the network node described in connection with FIG. **2**. Additionally, or alternatively, one or more components shown in FIG. **9** may be implemented within one or more components described in connection with FIG. **2**. Additionally, or alternatively, one or more components of the set of components may be implemented at least in part as software stored in a memory. For example, a component (or a portion of a component) may be implemented as instructions or code stored in a non-transitory computer-readable medium and executable by a controller or a processor to perform the functions or operations of the component.

[0132] The reception component **902** may receive communications, such as reference signals, control information, data communications, or a combination thereof, from the apparatus **906**. The reception component **902** may provide received communications to one or more other components of the apparatus **900**. In some aspects, the reception component **902** may perform signal processing on the received communications (such as filtering, amplification, demodulation, analog-to-digital conversion, demultiplexing, deinterleaving, de-mapping, equalization, interference cancellation, or decoding, among other examples), and may provide the processed signals to the one or more other components of the apparatus **900**. In some aspects, the reception component **902** may include one or more antennas, a modem, a demodulator, a MIMO detector, a receive processor, a controller/processor, a memory, or a combination thereof, of the network node described in connection with FIG. **2**.

[0133] The transmission component **904** may transmit communications, such as reference signals, control information, data communications, or a combination thereof, to the apparatus **906**. In some aspects, one or more other components of the apparatus **900** may generate communications and may provide the generated communications to the transmission component **904** for transmission to the apparatus **906**. In some aspects, the transmission component **904** may perform signal processing on the generated communications (such as filtering, amplification, modulation, digital-to-analog conversion, multiplexing, interleaving, mapping, or encoding, among other examples), and may transmit the processed signals to the apparatus **906**. In some aspects, the transmission component **904** may include one or more antennas, a modem, a modulator, a transmit MIMO processor, a transmit processor, a controller/processor, a memory, or a combination thereof, of the network node described in connection with FIG. **2**. In some aspects, the transmission component **904** may be co-located with the reception component **902** in a transceiver.

[0134] In some examples, means for transmitting, outputting, or sending (or means for outputting for transmission) may include one or more antennas, a modulator, a transmit MIMO processor, a transmit processor, or a combination thereof, of the network node described above in connection with FIG. **2**.

[0135] In some examples, means for receiving (or means for obtaining) may include one or more antennas, a demodulator, a MIMO detector, a receive processor, or a combination thereof, of the network node described above in connection with FIG. **2**.

[0136] In some cases, rather than actually transmitting, for example, signals and/or data, a device may have an interface to output signals and/or data for transmission (a means for outputting). For example, a processor may output signals and/or data, via a bus interface, to an RF front end for transmission. Similarly, rather than actually receiving signals and/or data, a device may have an interface to obtain the signals and/or data received from another device (a means for obtaining). For example, a processor may obtain (or receive) the signals and/or data, via a bus interface, from an RF front end for reception. In various aspects, an RF front end may include various components, including transmit and receive processors, transmit and receive MIMO processors, modulators, demodulators, and the like, such as depicted in the examples in FIG. **2**.

[0137] In some examples, means for determining may include various processing system components, such as a receive processor, a transmit processor, a controller/processor, a memory, or a combination thereof, of the network node described above in connection with FIG. **2**.

[0138] The communication manager **908** and/or the reception component **902** may receive, from a UE, a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation.

[0139] In some aspects, the communication manager **908** may include one or more antennas, a modem, a controller/processor, a memory, or a combination thereof, of the network node described in connection with FIG. **2**. In some aspects, the communication manager **908** may include the reception component **902** and/or the transmission component **904**. In some aspects, the communication manager **808** may be, be similar to, include, or be included in, the communication manager **140** depicted in FIGS. **1** and **2**.

[0140] The communication manager **908** and/or the transmission component **904** may transmit, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0141] The number and arrangement of components shown in FIG. **9** are provided as an example. In practice, there may be additional components, fewer components, different components, or differently arranged components than those shown in FIG. **9**. Furthermore, two or more components shown in FIG. **9** may be implemented within a single component, or a single component shown in FIG. **9** may be implemented as multiple, distributed components. Additionally, or alternatively, a set of (one or more) components shown in FIG. **9** may perform one or more functions described as being performed by another set of components shown in FIG. **9**.

[0142] The following provides an overview of some Aspects of the present disclosure:

[0143] Aspect 1: A method of wireless communication performed by an apparatus of a user equipment (UE), comprising: transmitting, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and receiving, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0144] Aspect 2: The method of Aspect 1, wherein an angle between the first antenna orientation and the second antenna orientation is within an angle threshold.

[0145] Aspect 3: The method of Aspect 2, wherein the first antenna orientation is parallel to the second antenna orientation.

[0146] Aspect 4: The method of Aspect 1, wherein an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

[0147] Aspect 5: The method of any of Aspects 1-4, wherein an angle between the first antenna orientation and a surface of the UE is within a surface threshold.

[0148] Aspect 6: The method of any of Aspects 1-5, further comprising determining one or more beams corresponding to the second frequency range based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

[0149] Aspect 7: The method of any of Aspects 1-6, wherein the loss of polarization performance associated with the at least one antenna array corresponds to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

[0150] Aspect 8: The method of any of Aspects 1-7, wherein the at least one communication parameter is indicative of at least one of a first set of digital precoders associated with dual-polarized transmissions corresponding to first frequency range and a second set of digital precoders associated with the second frequency range.

[0151] Aspect 9: The method of any of Aspects 1-8, wherein the at least one communication parameter comprises a data rate achieved at the UE.

[0152] Aspect 10: The method of any of Aspects 1-9, wherein the at least one communication parameter comprises at least one of a resource allocation associated with a single port or two ports, the resource allocation corresponding to at least one of a sounding reference signal (SRS) or a channel state information reference signal (CSI-RS).

[0153] Aspect 11: A method of wireless communication performed by an apparatus of a network node, comprising: receiving, from a user equipment (UE), a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and transmitting, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

[0154] Aspect 12: The method of Aspect 11, wherein an angle between the first antenna orientation and the second antenna orientation is within an angle threshold.

[0155] Aspect 13: The method of Aspect 12, wherein the first antenna orientation is parallel to the second antenna orientation.

[0156] Aspect 14: The method of Aspect 11, wherein an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

[0157] Aspect 15: The method of any of Aspects 11-14, wherein an angle between the first antenna orientation and a surface of the UE is within a surface threshold.

[0158] Aspect 16: The method of any of Aspects 11-15, wherein one or more beams corresponding to the second frequency range are based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

[0159] Aspect 17: The method of any of Aspects 11-16, wherein the loss of polarization performance associated with the at least one antenna array corresponds to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

[0160] Aspect 18: The method of any of Aspects 11-17, wherein the at least one communication parameter is indicative of at least one of a first set of digital precoders associated with dual-polarized transmissions corresponding to first frequency range and a second set of digital precoders associated with the second frequency range.

[0161] Aspect 19: The method of any of Aspects 11-18, wherein the at least one communication parameter comprises a data rate achieved at the UE.

[0162] Aspect 20: The method of any of Aspects 11-19, wherein the at least one communication parameter comprises at least one of a resource allocation associated with a single port or two ports, the resource allocation corresponding to at least one of a sounding reference signal (SRS) or a channel state information reference signal (CSI-RS).

[0163] Aspect 21: An apparatus for wireless communication at a device, comprising a processor; memory coupled with the processor; and instructions stored in the memory and executable by the processor to cause the apparatus to perform the method of one or more of Aspects 1-10.

[0164] Aspect 22: A device for wireless communication, comprising a memory and one or more processors coupled to the memory, the one or more processors configured to perform the method of one or more of Aspects 1-10.

[0165] Aspect 23: An apparatus for wireless communication, comprising at least one means for performing the method of one or more of Aspects 1-10.

[0166] Aspect 24: A non-transitory computer-readable medium storing code for wireless communication, the code comprising instructions executable by a processor to perform the method of one or more of Aspects 1-10.

[0167] Aspect 25: A non-transitory computer-readable medium storing a set of instructions for wireless communication, the set of instructions comprising one or more instructions that, when executed by one or more processors of a device, cause the device to perform the method of one or more of Aspects 1-10.

[0168] Aspect 26: An apparatus for wireless communication at a device, comprising a processor; memory coupled with the processor; and instructions stored in the memory and executable by the processor to cause the apparatus to perform the method of one or more of Aspects 11-20.

[0169] Aspect 27: A device for wireless communication, comprising a memory and one or more processors coupled to the memory, the one or more processors configured to perform the method of one or more of Aspects 11-20.

[0170] Aspect 28: An apparatus for wireless communication, comprising at least one means for performing the method of one or more of Aspects 11-20.

[0171] Aspect 29: A non-transitory computer-readable medium storing code for wireless communication, the code comprising instructions executable by a processor to perform the method of one or more of Aspects 11-20.

[0172] Aspect 30: A non-transitory computer-readable medium storing a set of instructions for wireless communication, the set of instructions comprising one or more instructions that, when executed by one or more processors of a device, cause the device to perform the method of one or more of Aspects 11-20.

[0173] The foregoing disclosure provides illustration and description but is not intended to be exhaustive or to limit the aspects to the precise forms disclosed. Modifications and variations may be made in light of the above disclosure or may be acquired from practice of the aspects.

[0174] As used herein, the term "component" is intended to be broadly construed as hardware and/or a combination of hardware and software. "Software" shall be construed broadly to mean instructions, instruction sets, code, code segments, program code, programs, subprograms, software modules, applications, software applications, software packages, routines, subroutines, objects, executables, threads of execution, procedures, and/or functions, among other examples, whether referred to as software, firmware, middleware, microcode, hardware description language, or otherwise. As used herein, a "processor" is implemented in hardware and/or a combination of hardware and software. It will be apparent that systems and/or methods described herein may be implemented in different forms of hardware and/or a combination of hardware and software. The actual specialized control hardware or software code used to implement these systems and/or methods is not limiting of the aspects. Thus, the operation and behavior of the systems and/or methods are described herein without reference to specific software code, since those skilled in the art will understand that software and hardware can be designed to implement the systems and/or methods based, at least in part, on the description herein.

[0175] As used herein, "satisfying a threshold" may, depending on the context, refer to a value being greater than the threshold, greater than or equal to the threshold, less than the threshold, less than or equal to the threshold, equal to the threshold, not equal to the threshold, or the like.

[0176] Even though particular combinations of features are recited in the claims and/or disclosed in the specification, these combinations are not intended to limit the disclosure of various aspects. Many of these features may be combined in ways not specifically recited in the claims and/or disclosed in the specification. The disclosure of various aspects includes each dependent claim in combination with every other claim in the claim set. As used herein, a phrase referring to "at least one of" a list of items refers to any combination of those items, including single members. As an example, "at least one of: a, b, or c" is intended to cover a, b, c, a+b, a+c, b+c, and a+b+c, as well as any combination with multiples of the same element (e.g., a+a, a+a+a, a+a+b, a+a+c, a+b+b, a+c+c, b+b, b+b+b, b+b+c, c+c, and c+c+c, or any other ordering of a, b, and c).

[0177] No element, act, or instruction used herein should be construed as critical or essential unless explicitly described as such. Also, as used herein, the articles "a" and "an" are intended to include one or more items and may be used interchangeably with "one or more." Further, as used herein, the article "the" is intended to include one or more items referenced in connection with the article "the" and may be used interchangeably with "the one or more." Furthermore, as used herein, the terms "set" and "group" are intended to include one or more items and may be used interchangeably with "one or more." Where only one item is intended, the phrase "only one" or similar language is used. Also, as used herein, the terms "has," "have," "having," or the like are intended to be open-ended terms that do not limit an element that they modify (e.g., an element "having" A may also have B). Further, the phrase "based on" is intended to mean "based, at least in part, on" unless explicitly stated otherwise. Also, as used herein, the term "or" is intended to be inclusive when used in a series and may be used interchangeably with "and/or," unless explicitly stated otherwise (e.g., if used in combination with "either" or "only one of").

1. A user equipment (UE) for wireless communication, comprising:
- one or more memories; and
- one or more processors, coupled to the one or more memories, configured to:
  - transmit, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and
  - receive, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

2. The UE of claim **1**, wherein an angle between the first antenna orientation and the second antenna orientation is within an angle threshold.

3. The UE of claim **2**, wherein the first antenna orientation is parallel to the second antenna orientation.

4. The UE of claim **1**, wherein an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

5. The UE of claim **1**, wherein an angle between the first antenna orientation and a surface of the UE is within a surface threshold.

6. The UE of claim **1**, wherein the one or more processors are further configured to determine one or more beams corresponding to the second frequency range based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

7. The UE of claim **1**, wherein the loss of polarization performance associated with the at least one antenna array corresponds to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

8. The UE of claim **1**, wherein the at least one communication parameter is indicative of at least one of a first set of digital precoders associated with dual-polarized transmissions corresponding to the first frequency range and a second set of digital precoders associated with the second frequency range.

9. The UE of claim **1**, wherein the at least one communication parameter comprises a data rate achieved at the UE.

10. The UE of claim **1**, wherein the at least one communication parameter comprises at least one of a resource allocation associated with a single port or two ports, the resource allocation corresponding to at least one of a sounding reference signal (SRS) or a channel state information reference signal (CSI-RS).

11. A network node for wireless communication, comprising:

one or more memories; and

one or more processors, coupled to the one or more memories, configured to:

receive, from a user equipment (UE), a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and

transmit, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

12. The network node of claim **11**, wherein an angle between the first antenna orientation and the second antenna orientation is within an angle threshold.

13. The network node of claim **12**, wherein the first antenna orientation is parallel to the second antenna orientation.

14. The network node of claim **11**, wherein an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

15. The network node of claim **11**, wherein an angle between the first antenna orientation and a surface of the UE is within a surface threshold.

16. The network node of claim **11**, wherein one or more beams corresponding to the second frequency range are based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

17. The network node of claim **11**, wherein the loss of polarization performance associated with the at least one antenna array corresponds to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

18. The network node of claim **11**, wherein the at least one communication parameter is indicative of at least one of a first set of digital precoders associated with dual-polarized transmissions corresponding to the first frequency range and a second set of digital precoders associated with the second frequency range.

19. The network node of claim **11**, wherein the at least one communication parameter comprises a data rate achieved at the UE.

20. The network node of claim **11**, wherein the at least one communication parameter comprises at least one of a resource allocation associated with a single port or two ports, the resource allocation corresponding to at least one of a sounding reference signal (SRS) or a channel state information reference signal (CSI-RS).

21. A method of wireless communication performed by an apparatus of a user equipment (UE), comprising:

transmitting, to a network node, a polarization performance loss indication that is indicative of a loss in polarization performance based on transitioning from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and

receiving, from the network node, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

22. The method of claim **21**, wherein an angle between the first antenna orientation and the second antenna orientation is within an angle threshold.

23. The method of claim **21**, wherein an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

24. The method of claim **21**, wherein an angle between the first antenna orientation and a surface of the UE is within a surface threshold.

25. The method of claim **21**, further comprising determining one or more beams corresponding to the second frequency range based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

26. The method of claim **21**, wherein the loss of polarization performance associated with the at least one antenna array corresponds to a set of differences between a first set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a first set of beam weights applicable to the first frequency range and a second set of signal strength values associated with beamforming over dual-polarized transmissions corresponding to a second set of beam weights applicable to the second frequency range.

27. A method of wireless communication performed by an apparatus of a network node, comprising:

receiving, from a user equipment (UE), a polarization performance loss indication that is indicative of a loss in polarization performance based on a transition from a first operating state associated with a first frequency range to a second operating state associated with a second frequency range, wherein the first operating state corresponds to a first antenna configuration associated with at least one antenna array of the UE and the second operating state corresponds to a second antenna configuration associated with the at least one antenna array, wherein the first antenna configuration corresponds to a first antenna orientation and the second antenna configuration corresponds to a second antenna orientation; and

transmitting, to the UE, configuration information indicative of at least one communication parameter associated with the at least one antenna array and based on the polarization performance loss indication.

28. The method of claim **27**, wherein an angle between the first antenna orientation and the second antenna orientation is within an angle threshold.

29. The method of claim **27**, wherein an angle between the first antenna orientation and the second antenna orientation exceeds an angle threshold.

30. The method of claim **27**, wherein one or more beams corresponding to the second frequency range are based on at least one of beam correspondence information associated with one or more beams corresponding to the first frequency range and a tilt of the second antenna orientation relative to the first antenna orientation.

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