US 20250260599A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2025/0260599 A1**

(43) **Pub. Date: Aug. 14, 2025**

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(54) **SUCCESSIVE DIGITAL POST DISTORTION CORRECTION**

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(21) Appl. No.: **18/440,622**

(22) Filed: **Feb. 13, 2024**

Publication Classification

(51) **Int. Cl.**

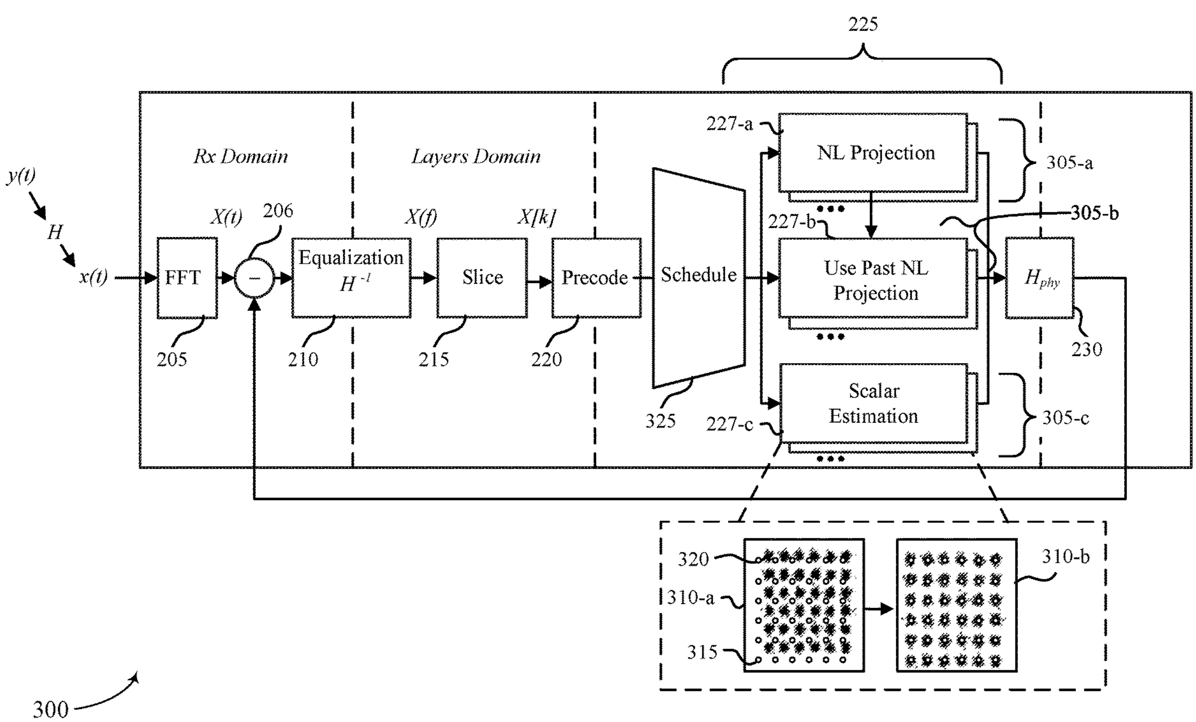
H04L 25/02	(2006.01)
H04W 72/12	(2023.01)
H04W 72/20	(2023.01)

(52) **U.S. Cl.**

CPC ***H04L 25/0202*** (2013.01); ***H04W 72/12*** (2013.01); ***H04W 72/20*** (2023.01)

(57) **ABSTRACT**

Methods, systems, and devices for wireless communication are described. A user equipment (UE) may transmit a capability message to a network entity indicating a capability of the UE to perform a successive non-linear distortion correction process. The UE may also transmit a control message indicating a quantity of parallel processes supported at the UE and associated with each of a quantity of sub-iterations of the successive non-linear distortion correction process. The network entity may transmit, and the UE may receive, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The UE may perform the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process in accordance with the schedule.



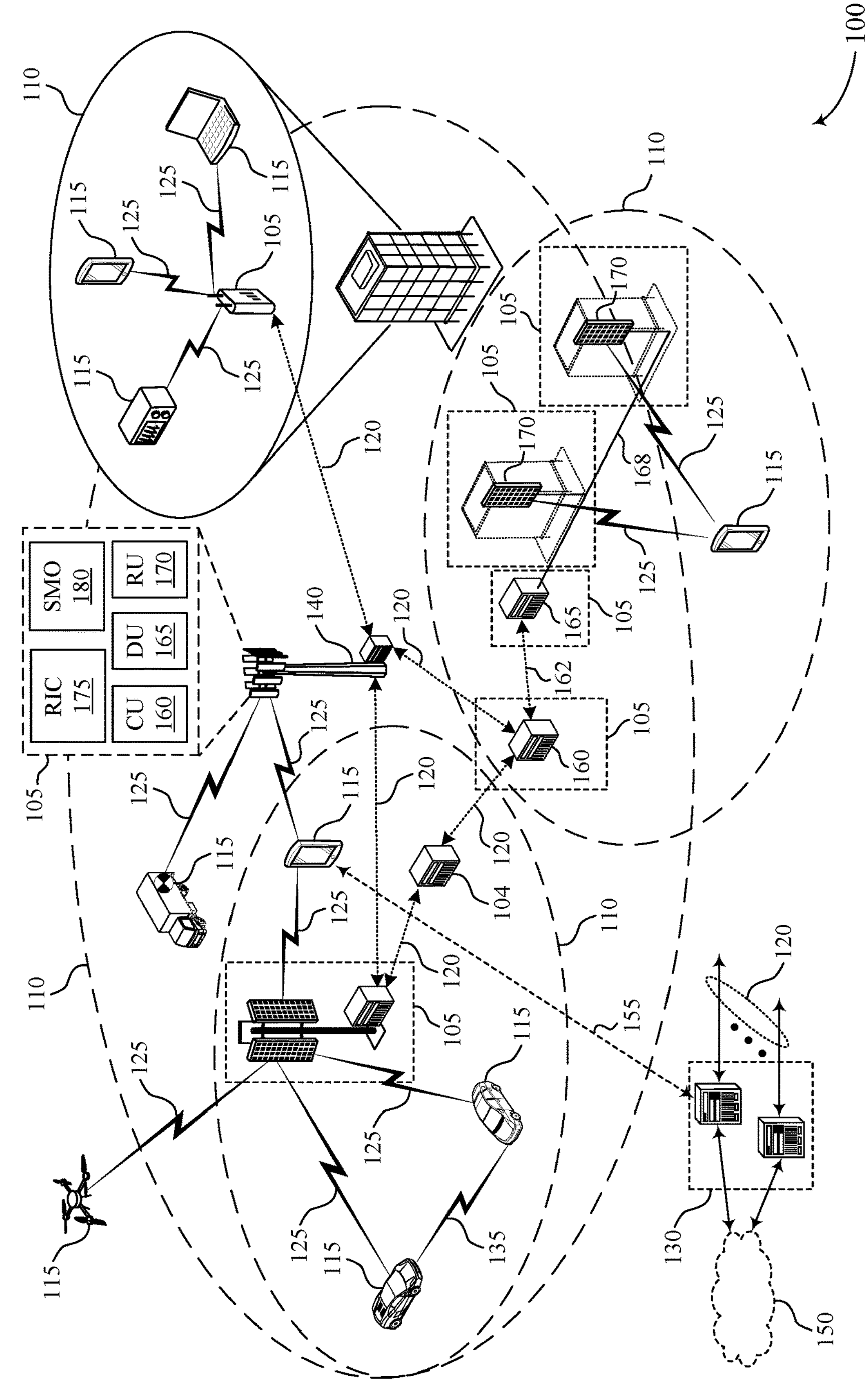

100
110
115
125
105
120
140
SMO 180
RIC 175
RU 170
DU 165
CU 160
170
168
165
162
160
104
155
135
130
150

FIG. 1

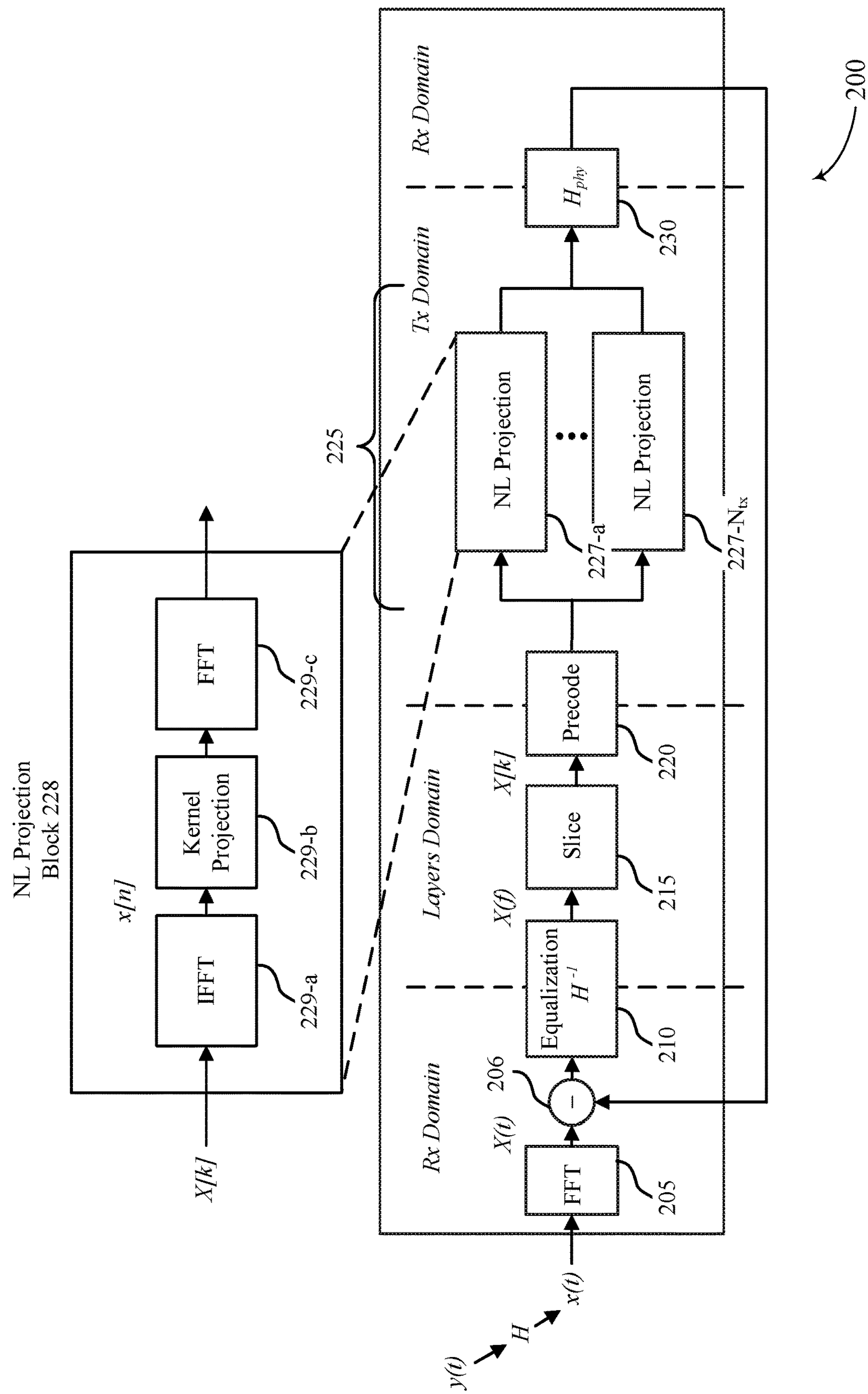

NL Projection Block 228
X[k]
x[n]
IFFT
229-a
Kernel Projection
229-b
FFT
229-c
225
Rx Domain
Layers Domain
Tx Domain
Rx Domain
y(t)
H
x(t)
FFT
205
X(t)
206
−
Equalization H^{-1}
210
X(f)
Slice
215
X[k]
Precode
220
NL Projection
227-a
NL Projection
$227\text{-}N_{tx}$
H_{phy}
230
200

FIG. 2

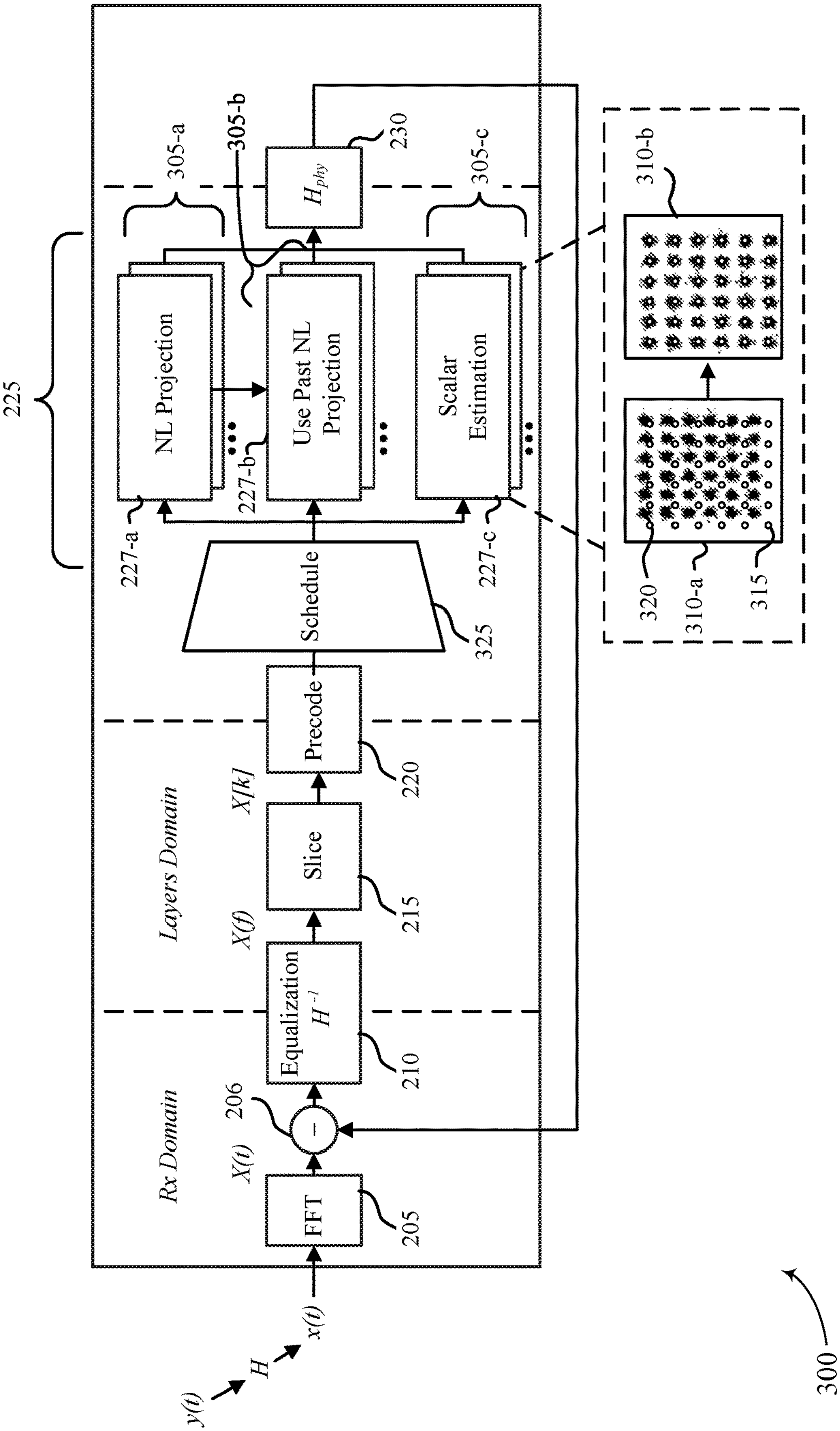

y(t)
H
x(t)
FFT
205
X(t)
206
−
Rx Domain
Equalization
H^{-1}
210
X(f)
Slice
215
X[k]
Layers Domain
Precode
220
Schedule
325
225
NL Projection
227-a
Use Past NL Projection
227-b
Scalar Estimation
227-c
305-a
305-b
305-c
H_{phy}
230
310-b
320
310-a
315
300

FIG. 3

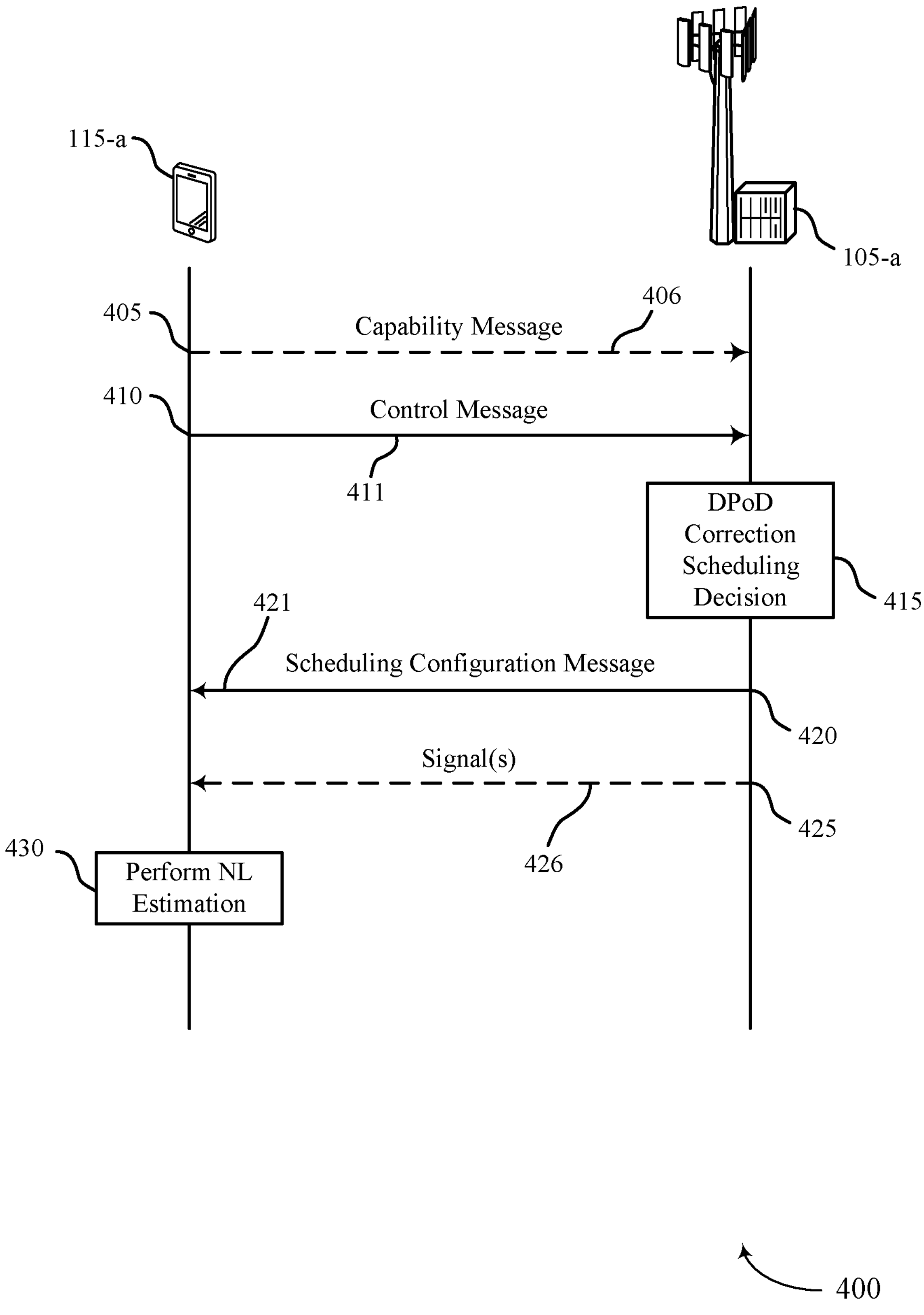

115-a
105-a
405
406
Capability Message
410
Control Message
411
DPoD Correction Scheduling Decision
415
421
Scheduling Configuration Message
420
Signal(s)
425
426
430
Perform NL Estimation
400

FIG. 4

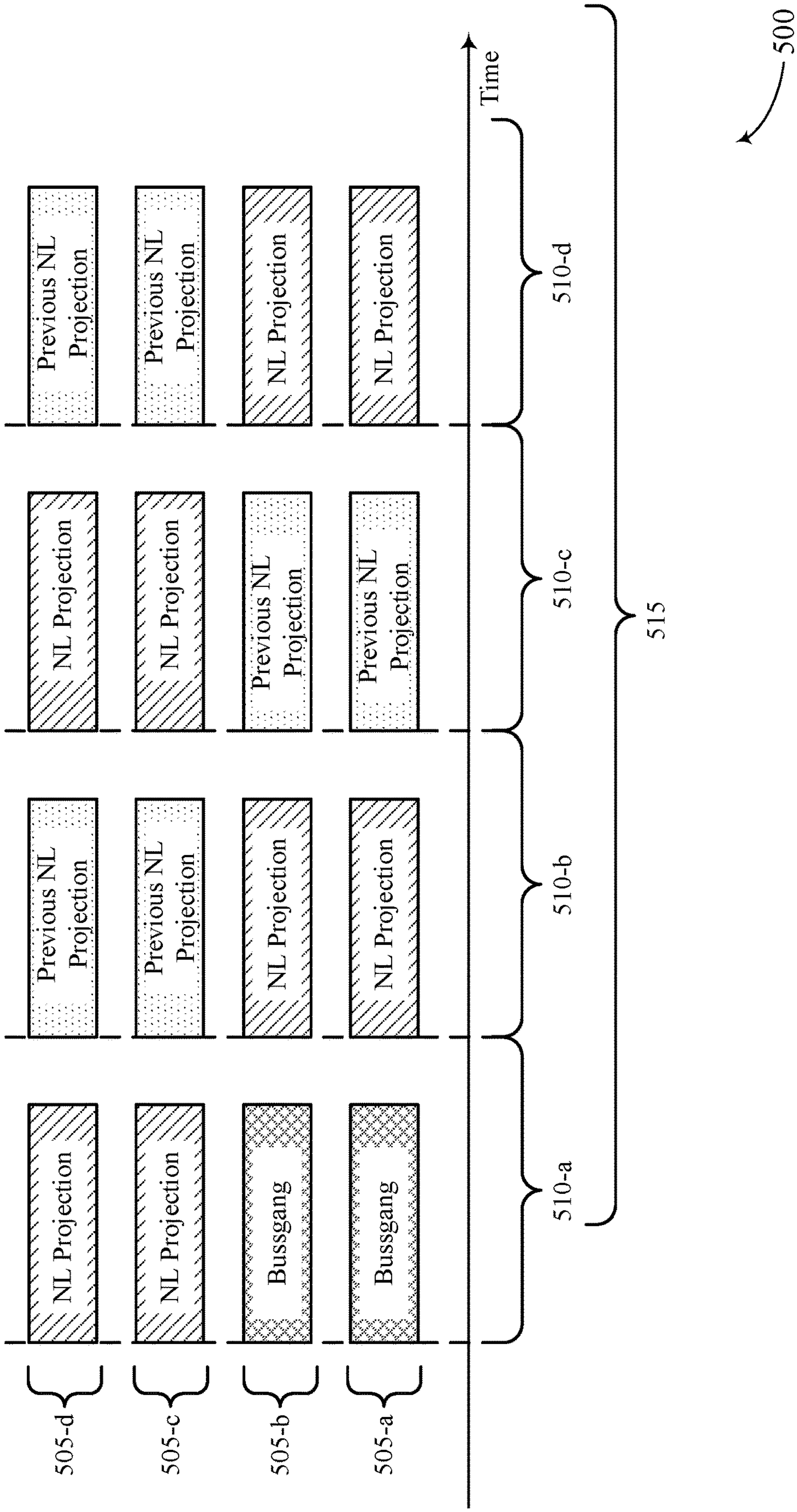

500
Time
515
510-a
510-b
510-c
510-d
505-a
505-b
505-c
505-d
NL Projection
Bussgang
Previous NL Projection

FIG. 5

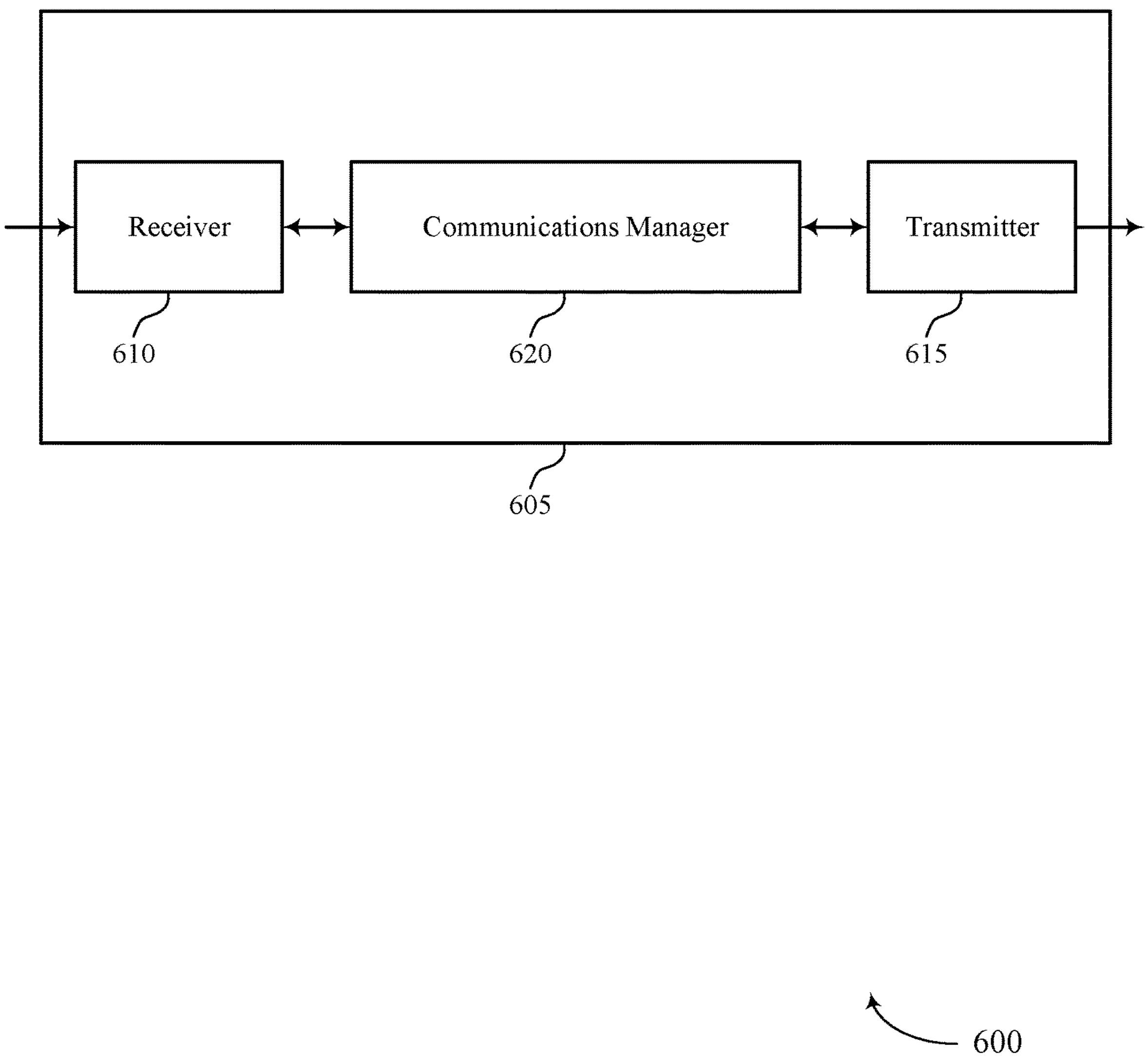

Receiver
Communications Manager
Transmitter
610
620
615
605
600

FIG. 6

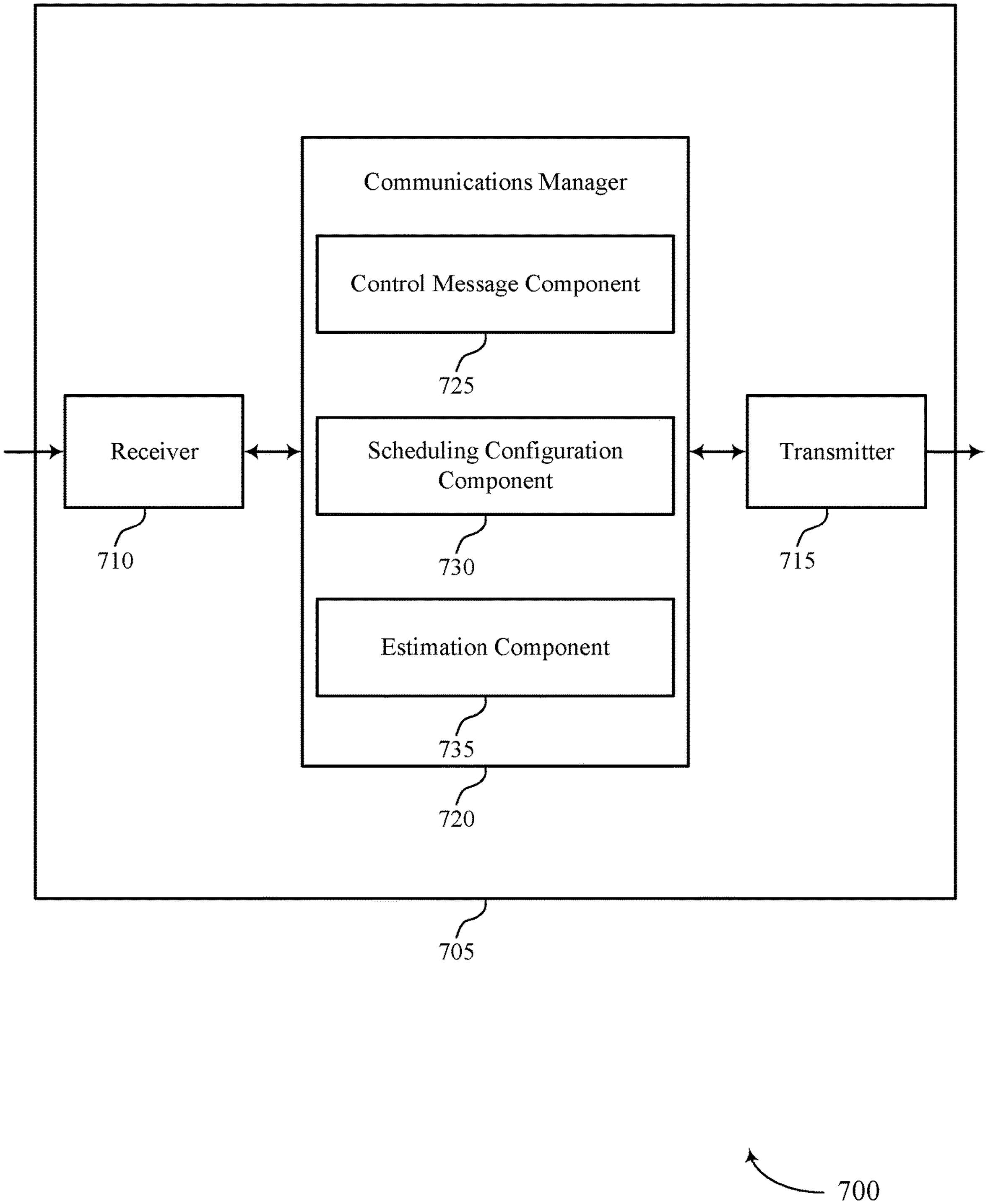
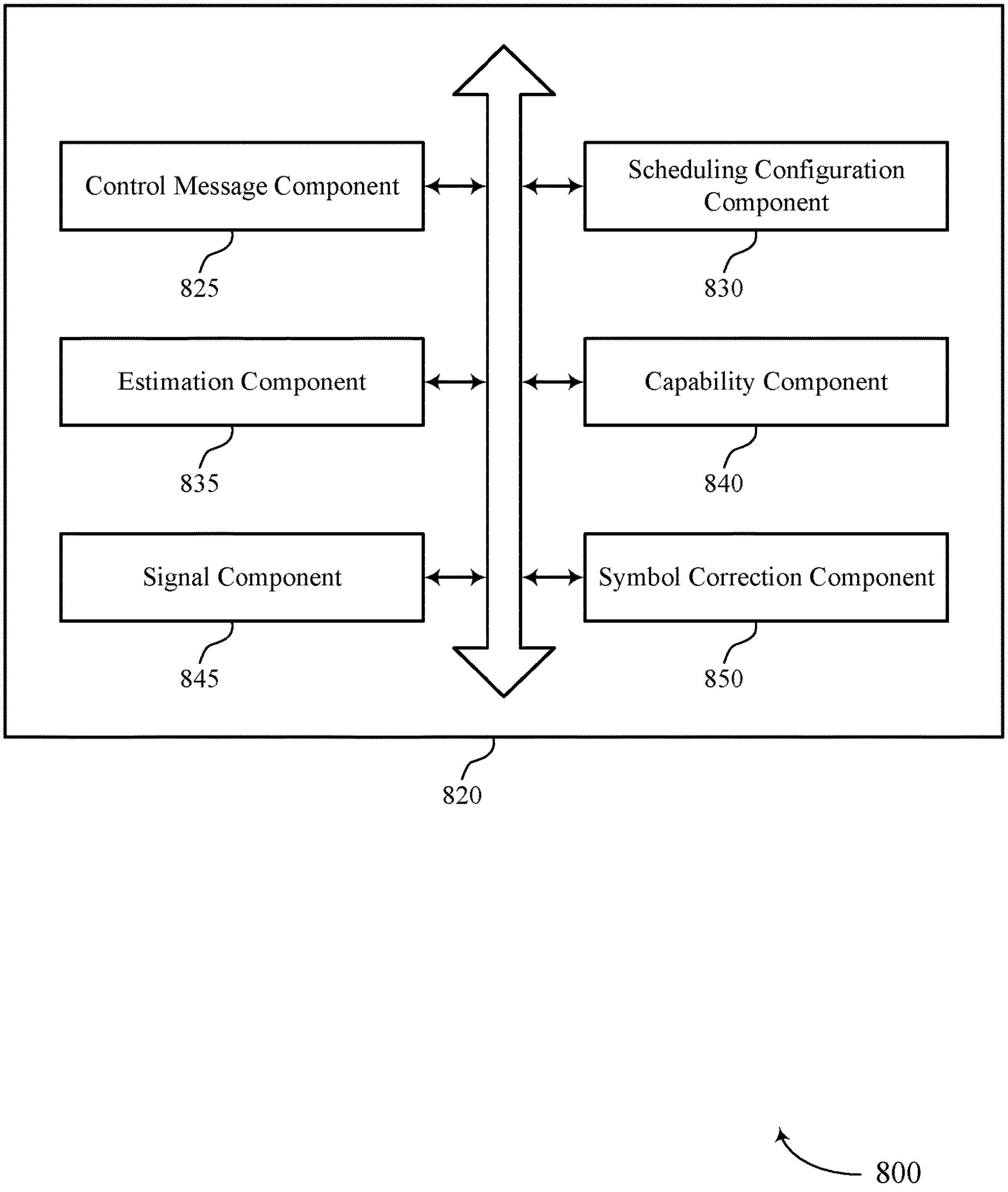

Communications Manager
Control Message Component
725
Receiver
Scheduling Configuration Component
Transmitter
710
730
715
Estimation Component
735
720
705
700

FIG. 7



Control Message Component
825
Scheduling Configuration Component
830
Estimation Component
835
Capability Component
840
Signal Component
845
Symbol Correction Component
850
820
800

FIG. 8

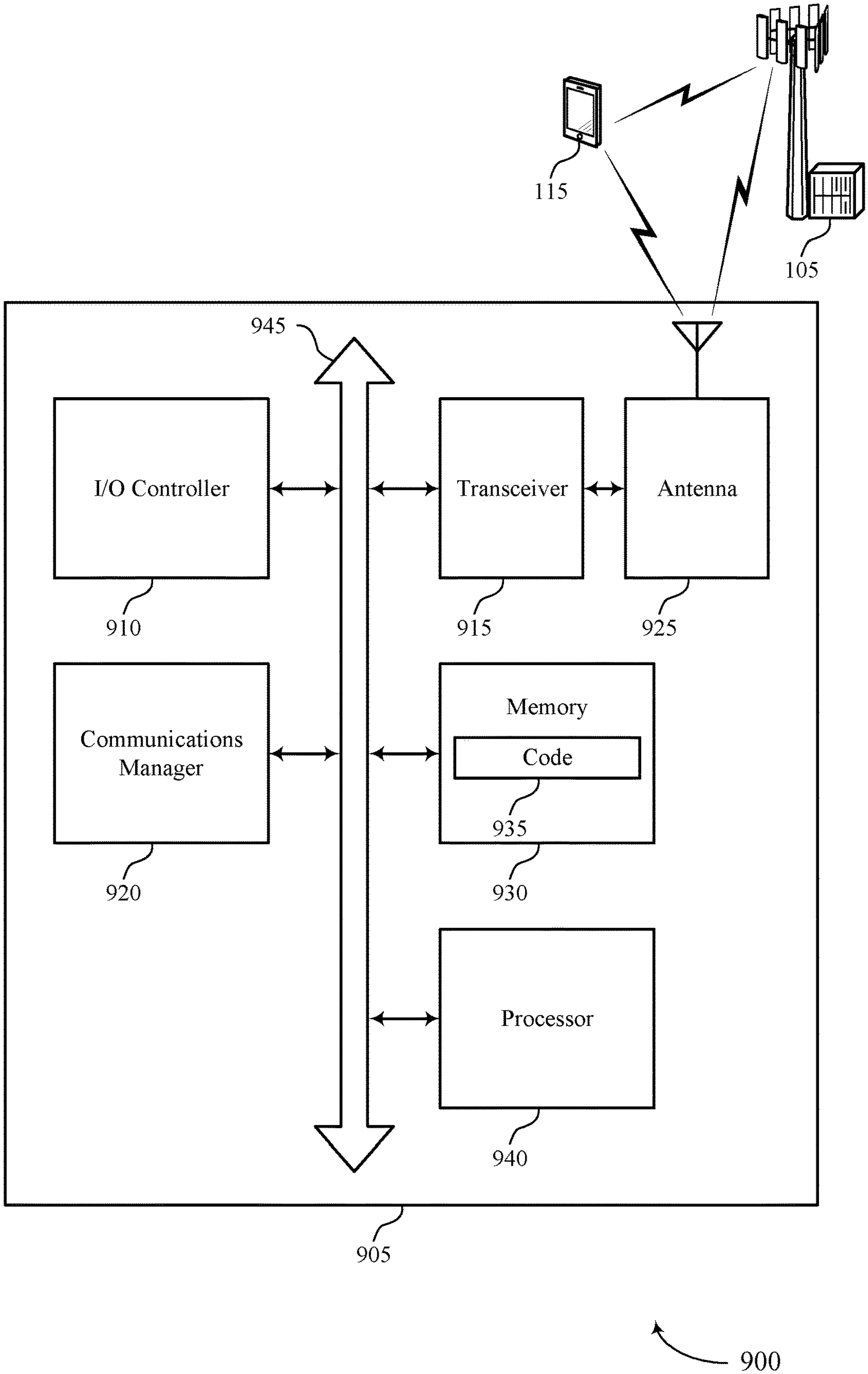

115
105
945
I/O Controller
Transceiver
Antenna
910
915
925
Communications Manager
Memory
Code
935
920
930
Processor
940
905
900

FIG. 9

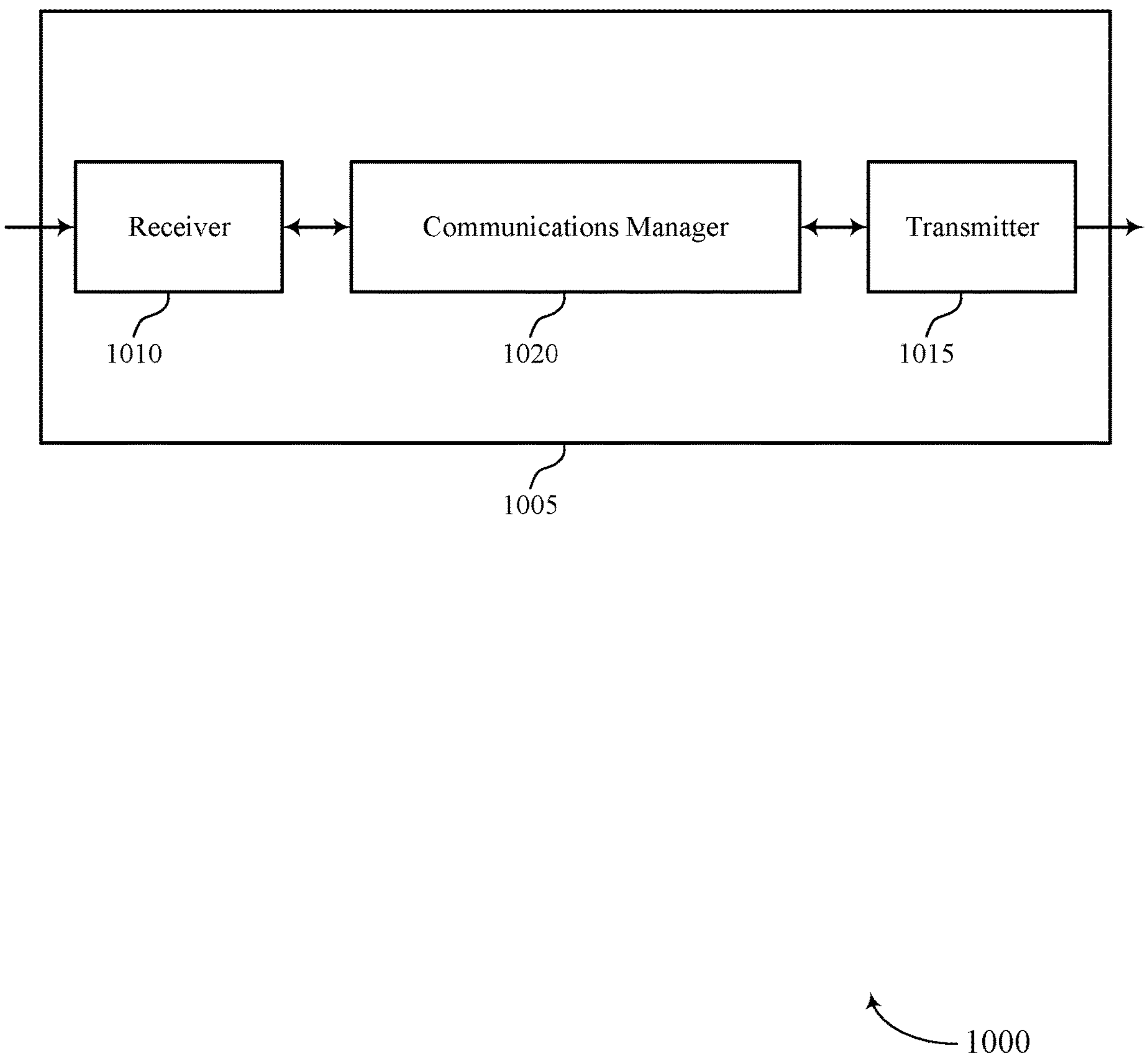

Receiver
Communications Manager
Transmitter
1010
1020
1015
1005
1000

FIG. 10

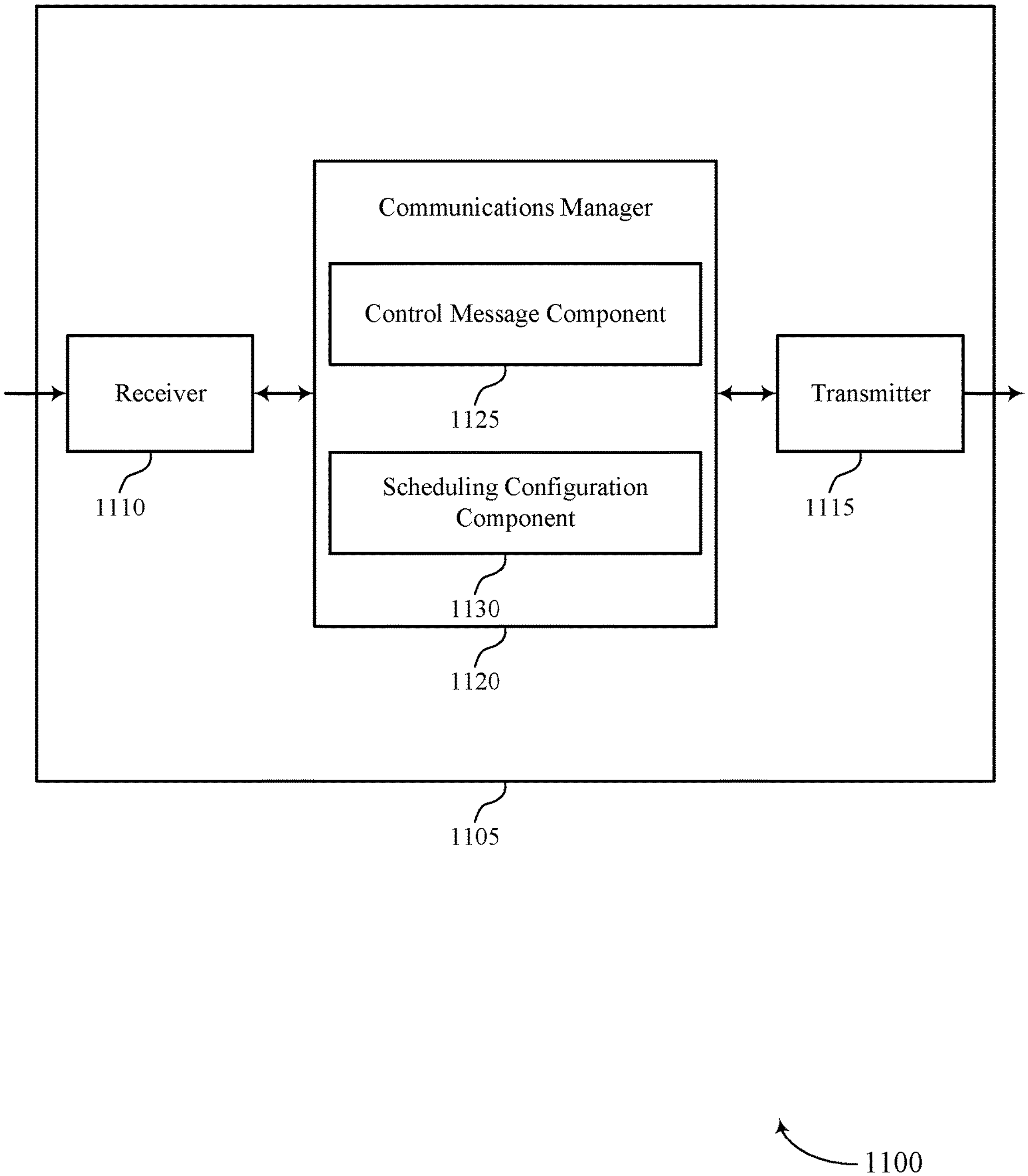

Communications Manager
Control Message Component
1125
Receiver
1110
Transmitter
1115
Scheduling Configuration Component
1130
1120
1105
1100

FIG. 11

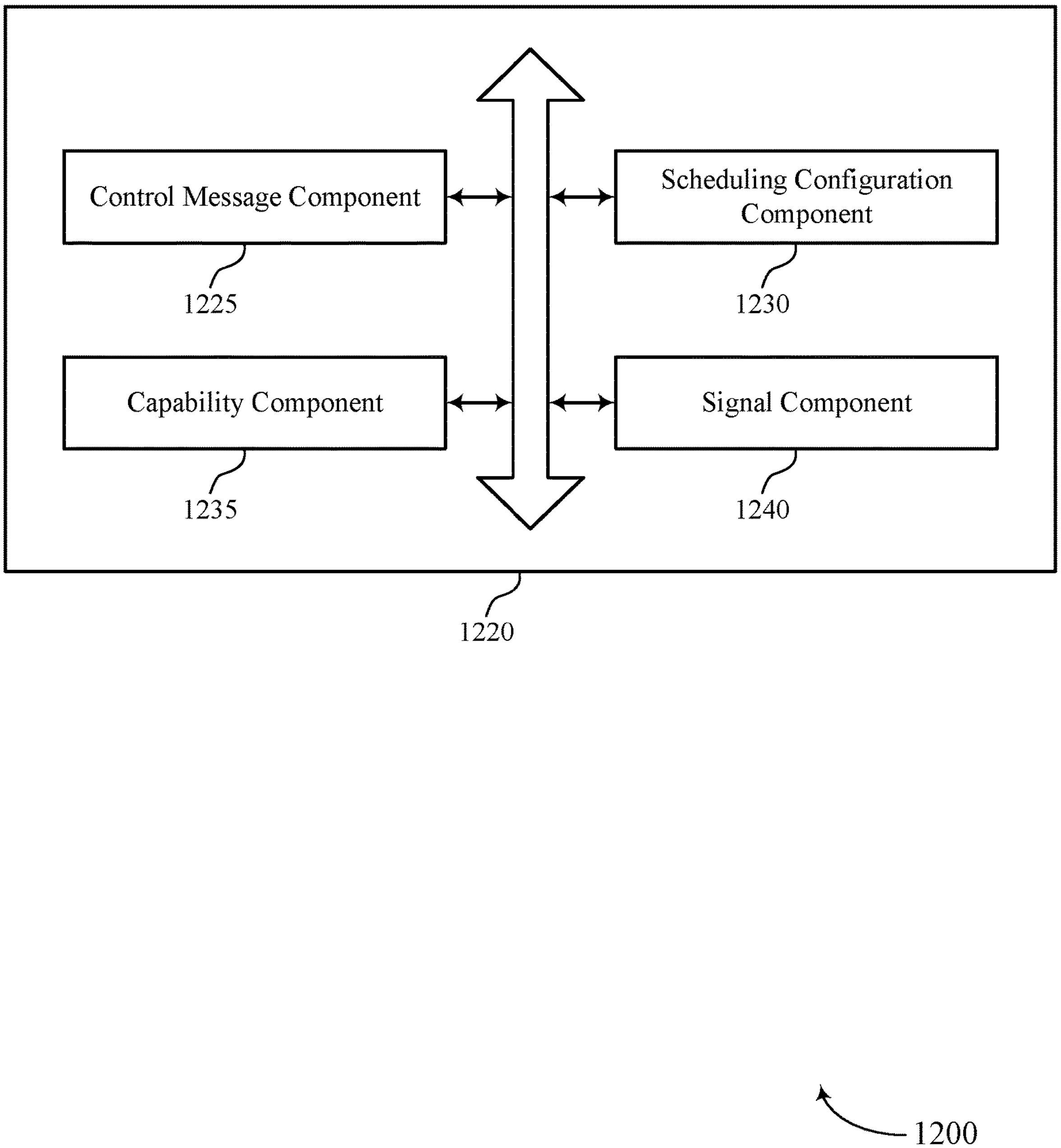

Control Message Component
1225
Scheduling Configuration Component
1230
Capability Component
1235
Signal Component
1240
1220
1200

FIG. 12

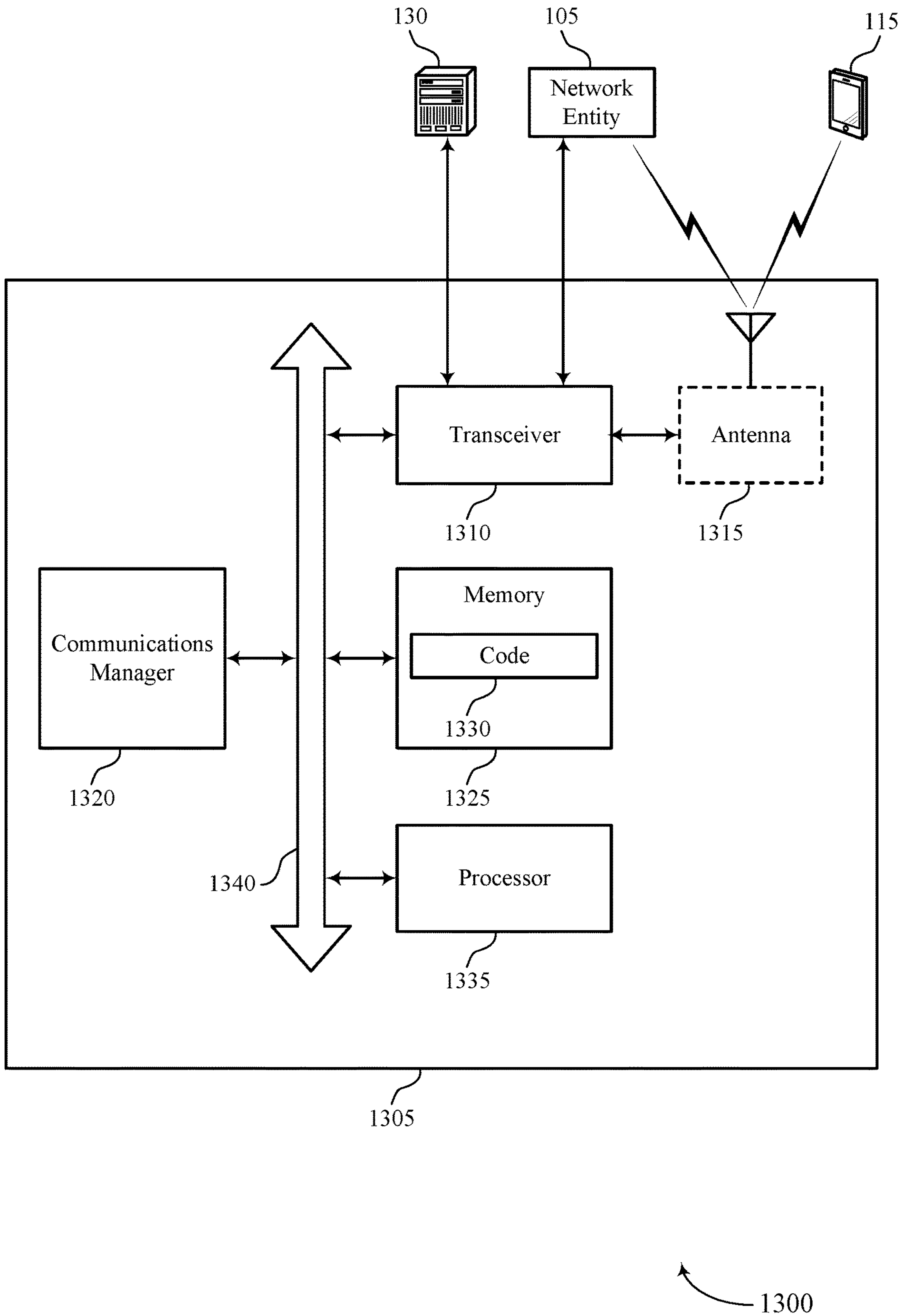

130
105
Network Entity
115
Transceiver
Antenna
1310
1315
Memory
Code
Communications Manager
1330
1320
1325
1340
Processor
1335
1305
1300

FIG. 13

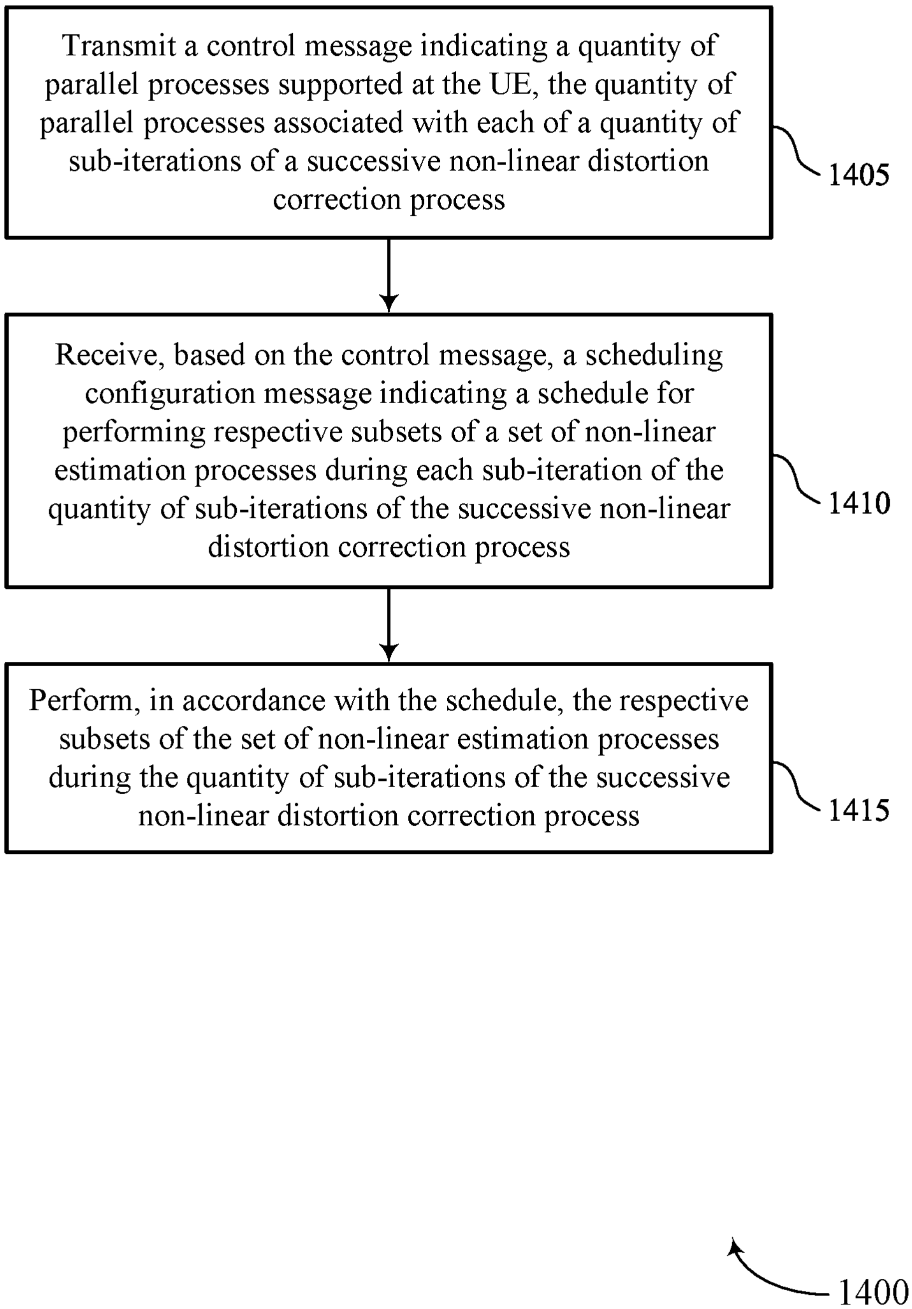

Transmit a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process
1405
Receive, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process
1410
Perform, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process
1415
1400

FIG. 14

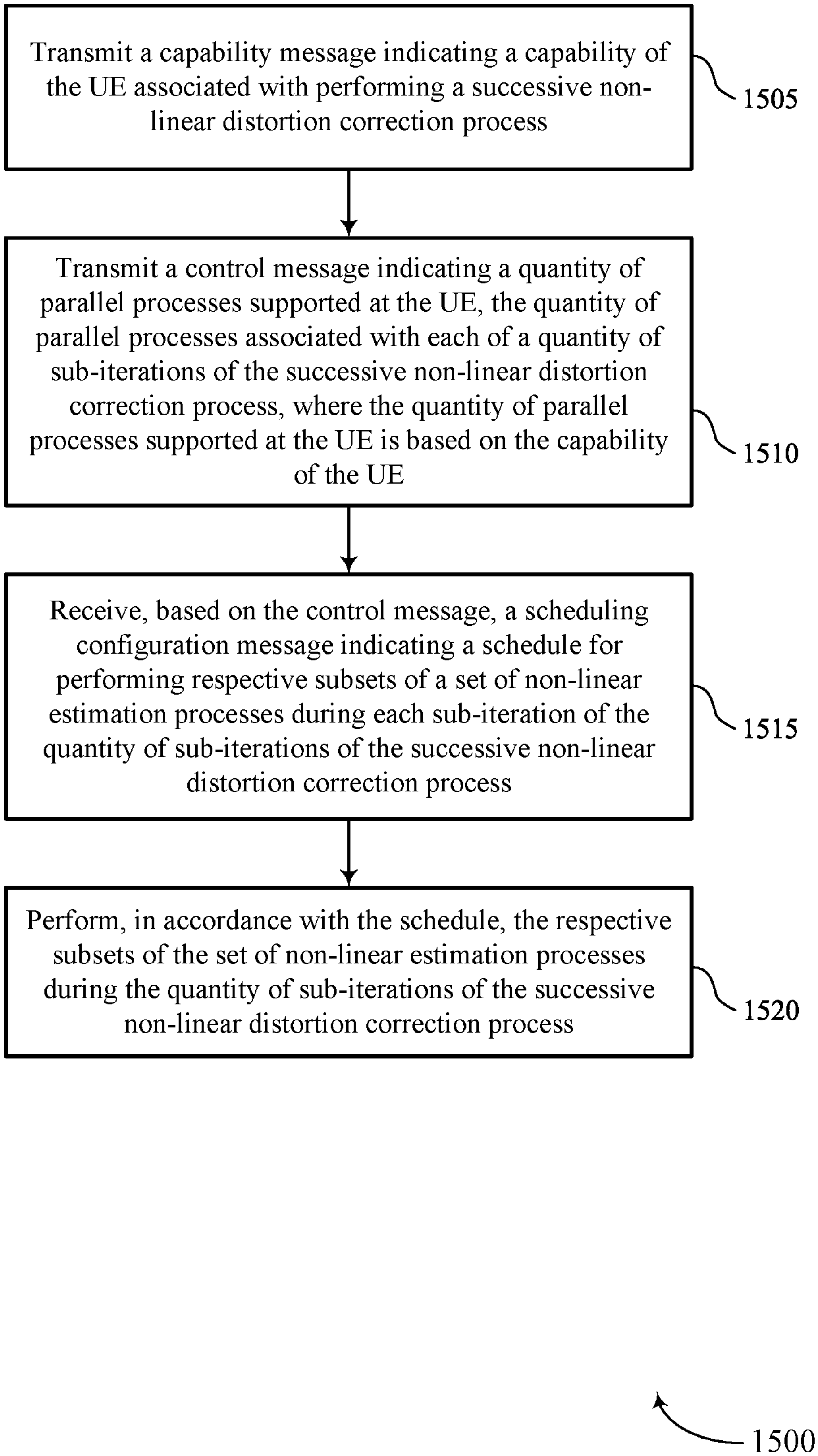

Transmit a capability message indicating a capability of the UE associated with performing a successive non-linear distortion correction process
1505
Transmit a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of the successive non-linear distortion correction process, where the quantity of parallel processes supported at the UE is based on the capability of the UE
1510
Receive, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process
1515
Perform, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process
1520
1500

FIG. 15

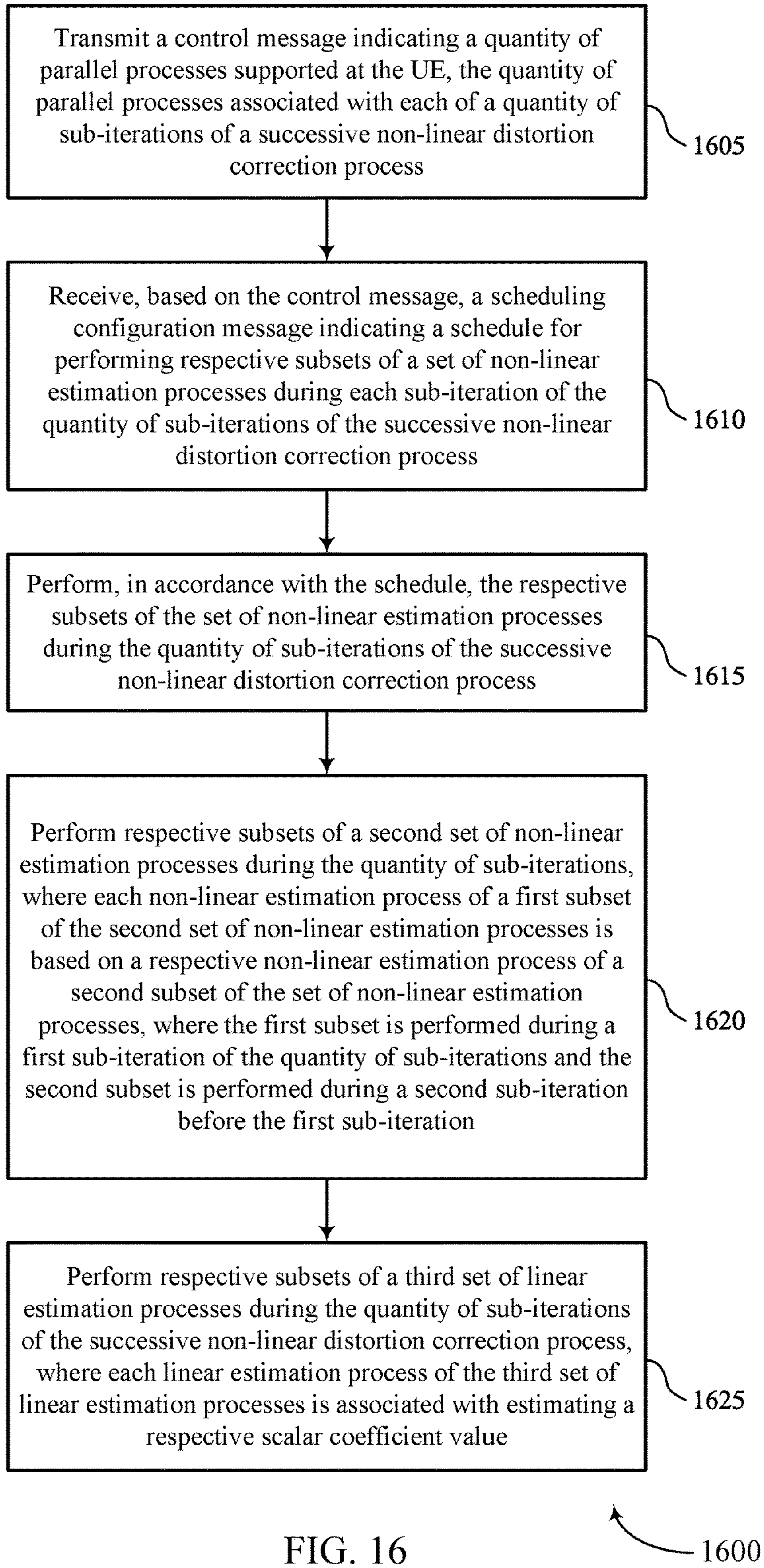

Transmit a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process
1605
Receive, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process
1610
Perform, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process
1615
Perform respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations, where each non-linear estimation process of a first subset of the second set of non-linear estimation processes is based on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes, where the first subset is performed during a first sub-iteration of the quantity of sub-iterations and the second subset is performed during a second sub-iteration before the first sub-iteration
1620
Perform respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process, where each linear estimation process of the third set of linear estimation processes is associated with estimating a respective scalar coefficient value
1625
1600

FIG. 16

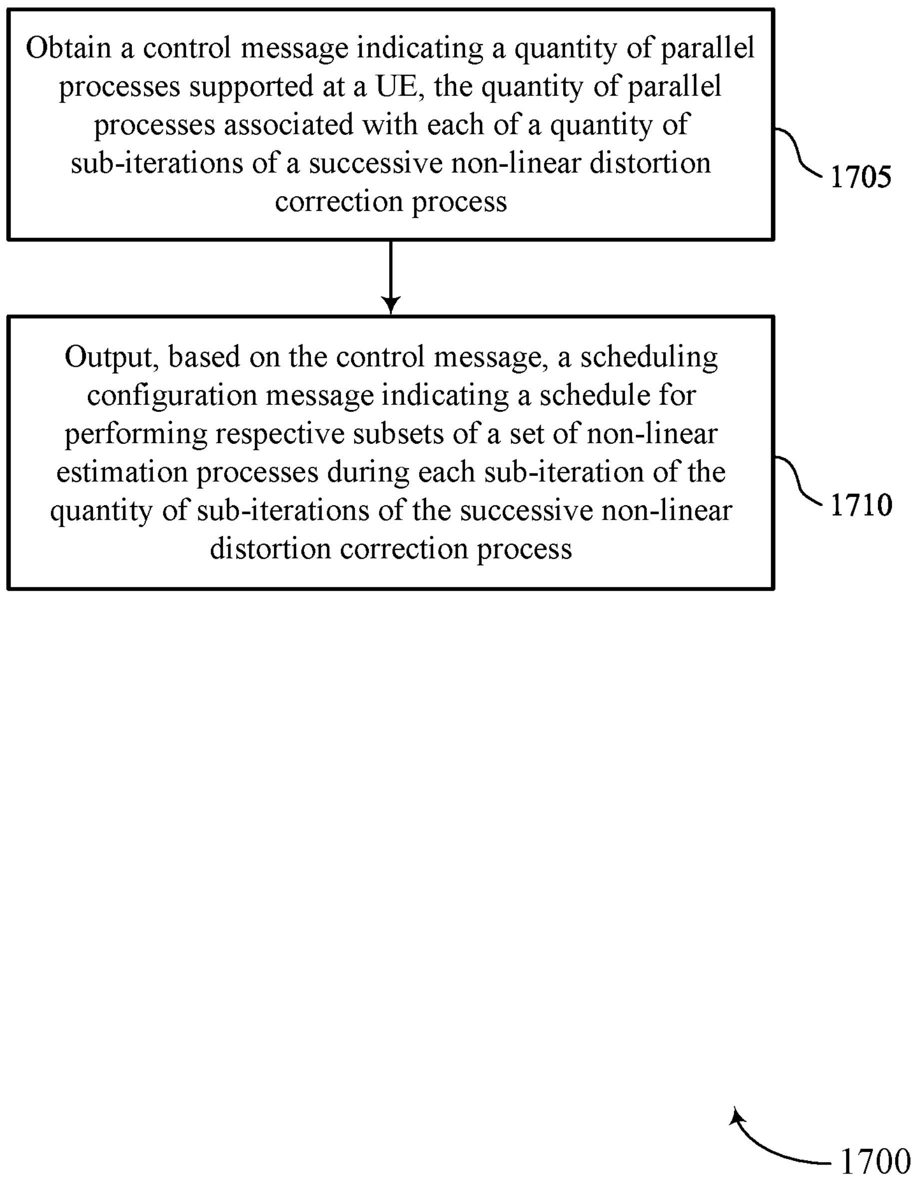

Obtain a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process
1705
Output, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process
1710
1700

FIG. 17

SUCCESSIVE DIGITAL POST DISTORTION CORRECTION

FIELD OF TECHNOLOGY

[0001] The following relates to wireless communication, including successive digital post distortion (DPoD) correction.

BACKGROUND

[0002] Wireless communications systems are widely deployed to provide various types of communication content such as voice, video, packet data, messaging, broadcast, and so on. These systems may be capable of supporting communication with multiple users by sharing the available system resources (e.g., time, frequency, and power). Examples of such multiple-access systems include fourth generation (4G) systems such as Long Term Evolution (LTE) systems, LTE-Advanced (LTE-A) systems, or LTE-A Pro systems, and fifth generation (5G) systems which may be referred to as New Radio (NR) systems. These systems may employ technologies such as code division multiple access (CDMA), time division multiple access (TDMA), frequency division multiple access (FDMA), orthogonal FDMA (OFDMA), or discrete Fourier transform spread orthogonal frequency division multiplexing (DFT-S-OFDM). A wireless multiple-access communications system may include one or more base stations, each supporting wireless communication for communication devices, which may be known as user equipment (UE).

SUMMARY

[0003] The described techniques relate to improved methods, systems, devices, and apparatuses that support successive digital post distortion (DPoD) correction. For example, the described techniques provide for a successive DPoD correction process estimating non-linear distortion for subsets of transmission lanes during sub-iterations. In some examples, a user equipment (UE) may transmit a capability message to a network entity indicating a capability of the UE to perform successive DPoD correction, and may transmit a control message to indicate a supported batch size corresponding to a quantity of parallel estimation processes the UE may perform. Based on the capability message and the batch size, the network entity may determine and transmit a schedule for performing one or more estimation (e.g., non-linear projection, estimation using previous results, scalar estimation) and correction processes to correct distortion associated with subsets of transmission lanes of the network entity. In accordance with the schedule, the UE may perform the one or more estimation and correction processes for the subsets during the sub-iterations to at least partially correct a non-linear distortion present in a received signal.

[0004] A method for wireless communication by a UE is described. The method may include transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process, receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, and performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0005] A UE for wireless communication is described. The UE may include one or more memories storing processor executable code, and one or more processors coupled with the one or more memories. The one or more processors may individually or collectively operable to execute the code to cause the UE to transmit a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process, receive, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, and perform, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0006] Another UE for wireless communication is described. The UE may include means for transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process, means for receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, and means for performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0007] A non-transitory computer-readable medium storing code for wireless communication is described. The code may include instructions executable by one or more processors to transmit a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process, receive, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, and perform, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0008] Some examples of the method, UEs, and non-transitory computer-readable medium described herein may further include operations, features, means, or instructions for transmitting a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, where the quantity of parallel processes supported at the UE may be based on the capability of the UE.

[0009] Some examples of the method, UEs, and non-transitory computer-readable medium described herein may further include operations, features, means, or instructions for receiving a first signal including one or more first symbols, where performing the respective subsets of the set of non-linear estimation processes may be based on estimating one or more second symbols of a second signal transmitted by a network entity and corresponding to the one or more first symbols of the first signal.

[0010] In some examples of the method, UEs, and non-transitory computer-readable medium described herein, at least partially correcting, during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, an amplitude and phase of a first symbol of the one or more first symbols based on performing a respective subset of the set of non-linear estimation processes.

[0011] Some examples of the method, UEs, and non-transitory computer-readable medium described herein may further include operations, features, means, or instructions for performing respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations, where each non-linear estimation process of a first subset of the second set of non-linear estimation processes may be based on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes, where the first subset may be performed during a first sub-iteration of the quantity of sub-iterations and the second subset may be performed during a second sub-iteration before the first sub-iteration.

[0012] Some examples of the method, UEs, and non-transitory computer-readable medium described herein may further include operations, features, means, or instructions for performing respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process, where each linear estimation process of the third set of linear estimation processes may be associated with estimating a respective scalar coefficient value.

[0013] In some examples of the method, UEs, and non-transitory computer-readable medium described herein, the quantity of parallel processes supported at the UE may be based on a threshold latency value, a threshold power value, a threshold complexity value, or any combination thereof.

[0014] In some examples of the method, UEs, and non-transitory computer-readable medium described herein, the schedule may be based on one or more parameters associated with one or more transmission lanes of a network entity.

[0015] In some examples of the method, UEs, and non-transitory computer-readable medium described herein, the schedule may be based on the quantity of parallel processes supported at the UE.

[0016] In some examples of the method, UEs, and non-transitory computer-readable medium described herein, the set of non-linear estimation processes includes one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

[0017] A method for wireless communication by a network entity is described. The method may include obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process and outputting, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0018] A network entity for wireless communication is described. The network entity may include one or more memories storing processor executable code, and one or more processors coupled with the one or more memories. The one or more processors may individually or collectively operable to execute the code to cause the network entity to obtain a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process and output, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0019] Another network entity for wireless communication is described. The network entity may include means for obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process and means for outputting, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0020] A non-transitory computer-readable medium storing code for wireless communication is described. The code may include instructions executable by one or more processors to obtain a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process and output, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0021] Some examples of the method, network entities, and non-transitory computer-readable medium described herein may further include operations, features, means, or instructions for obtaining a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, where the quantity of parallel processes supported at the UE may be based on the capability of the UE.

[0022] Some examples of the method, network entities, and non-transitory computer-readable medium described herein may further include operations, features, means, or instructions for outputting a first signal including one or more symbols, the first signal associated with the quantity of parallel processes and the quantity of sub iterations of the successive non-linear distortion correction process.

[0023] In some examples of the method, network entities, and non-transitory computer-readable medium described herein, the schedule may be based on one or more parameters associated with one or more transmission lanes of the network entity.

[0024] In some examples of the method, network entities, and non-transitory computer-readable medium described herein, the schedule may be based on the quantity of parallel processes supported at the UE.

[0025] In some examples of the method, network entities, and non-transitory computer-readable medium described herein, the set of non-linear estimation processes includes one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] FIG. **1** shows an example of a wireless communications system that supports successive digital post distortion (DPoD) correction in accordance with one or more aspects of the present disclosure.

[0027] FIG. **2** shows an example of a DPoD correction scheme that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0028] FIG. **3** shows an example of a DPoD correction scheme that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0029] FIG. **4** shows an example of a process flow that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0030] FIG. **5** shows an example of a correction schedule that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0031] FIGS. **6** and **7** show block diagrams of devices that support successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0032] FIG. **8** shows a block diagram of a communications manager that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0033] FIG. **9** shows a diagram of a system including a device that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0034] FIGS. **10** and **11** show block diagrams of devices that support successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0035] FIG. **12** shows a block diagram of a communications manager that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0036] FIG. **13** shows a diagram of a system including a device that supports successive DPoD correction in accordance with one or more aspects of the present disclosure.

[0037] FIGS. **14** through **17** show flowcharts illustrating methods that support successive DPoD correction in accordance with one or more aspects of the present disclosure.

DETAILED DESCRIPTION

[0038] To reduce power consumption, a network entity may reduce a supply voltage to a power amplifier used in transmissions. Reducing a supply voltage to a power amplifier may increase non-linear distortion in transmissions which may result in an increase of errors or failed decoding, among additional impairments to communications. In some examples, a UE may mitigate non-linear distortion by performing digital post distortion (DPoD) correction. For example, a DPoD correction process may include using a received signal to estimate non-linear distortion introduced in a corresponding originally transmitted signal and removing the estimated non-linear distortion from the received signal. For example, the UE may perform a DPoD correction process for each symbol of a signal by performing multiple non-linear projection processes in parallel to estimate the effect of transmission lanes at the network entity. The UE may also perform multiple iterations of projection and correction processes to further improve a signal quality. However, non-linear projection in DPoD may involve a high complexity cost, which may increase power consumption at the UE for each DPoD process performed in parallel. For systems involving large quantities of transmission lanes at a network entity, and hence large quantities of parallel DPoD non-linear projection procedures, such complexity may significantly reduce performance and increase latency in a network, while increasing a power consumption at one or more devices.

[0039] As described herein, a wireless communications system may support a successive DPoD correction process to reduce complexity, decrease latency, and improve performance. For example, a UE may determine a batch size for performing parallel non-linear estimation processes in DPoD correction and may indicate this batch size to the network entity. Based on the batch size, the network entity may schedule non-linear estimation (e.g., projection) and correction processes at the UE, corresponding to subsets of transmission lanes (e.g., antenna ports) at the network entity, for performing during successive sub-iterations of a larger iteration of the DPoD correction process. In accordance with the schedule, the UE may use a received signal (e.g., a precoded reference signal with precoded information) to perform non-linear distortion estimation for a respective subset of the transmission lanes in each sub-iteration. By performing a smaller amount of complex calculations at a time within smaller sub-iterations, the UE may utilize results at an earlier time during an iterative DPoD correction process, enabling the UE to increase a speed at which the UE improves a signal quality to meet a target metric. Successive DPoD correction may also improve a performance at an end of a time period compared to DPoD using larger iterations. Additionally, the UE may increase a speed and gain of non-linear correction further by performing simpler estimations for subsets of transmission lanes not scheduled for non-linear projection during a sub-iteration. For example, simpler estimations may be based on a previous non-linear projection or a scalar coefficient.

[0040] Aspects of the disclosure are initially described in the context of wireless communications systems. Aspects of the disclosure are further illustrated by and described with reference to DPoD correction schemes, process flows, and correction schedules. Aspects of the disclosure are further illustrated by and described with reference to apparatus diagrams, system diagrams, and flowcharts that relate to successive DPoD correction.

[0041] FIG. **1** shows an example of a wireless communications system **100** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The wireless communications system **100** may include one or more network entities **105**, one or more UEs **115**, and a core network **130**. In some examples, the wireless communications system **100** may be a Long Term Evolution (LTE) network, an LTE-Advanced (LTE-A) network, an LTE-A Pro network, a New Radio (NR) network, or a network operating in accordance with other systems and radio technologies, including future systems and radio technologies not explicitly mentioned herein.

[0042] The network entities **105** may be dispersed throughout a geographic area to form the wireless communications system **100** and may include devices in different forms or having different capabilities. In various examples, a network entity **105** may be referred to as a network element, a mobility element, a radio access network (RAN) node, or network equipment, among other nomenclature. In some examples, network entities **105** and UEs **115** may wirelessly communicate via one or more communication links **125** (e.g., a radio frequency (RF) access link). For example, a network entity **105** may support a coverage area **110** (e.g., a geographic coverage area) over which the UEs **115** and the network entity **105** may establish one or more communication links **125**. The coverage area **110** may be an example of a geographic area over which a network entity **105** and a UE **115** may support the communication of signals according to one or more radio access technologies (RATs).

[0043] The UEs **115** may be dispersed throughout a coverage area **110** of the wireless communications system **100**, and each UE **115** may be stationary, or mobile, or both at different times. The UEs **115** may be devices in different forms or having different capabilities. Some example UEs **115** are illustrated in FIG. **1**. The UEs **115** described herein may be capable of supporting communications with various types of devices, such as other UEs **115** or network entities **105**, as shown in FIG. **1**.

[0044] As described herein, a node of the wireless communications system **100**, which may be referred to as a network node, or a wireless node, may be a network entity **105** (e.g., any network entity described herein), a UE **115** (e.g., any UE described herein), a network controller, an apparatus, a device, a computing system, one or more components, or another suitable processing entity configured to perform any of the techniques described herein. For example, a node may be a UE **115**. As another example, a node may be a network entity **105**. As another example, a first node may be configured to communicate with a second node or a third node. In one aspect of this example, the first node may be a UE **115**, the second node may be a network entity **105**, and the third node may be a UE **115**. In another aspect of this example, the first node may be a UE **115**, the second node may be a network entity **105**, and the third node may be a network entity **105**. In yet other aspects of this example, the first, second, and third nodes may be different relative to these examples. Similarly, reference to a UE **115**, network entity **105**, apparatus, device, computing system, or the like may include disclosure of the UE **115**, network entity **105**, apparatus, device, computing system, or the like being a node. For example, disclosure that a UE **115** is configured to receive information from a network entity **105** also discloses that a first node is configured to receive information from a second node.

[0045] In some examples, network entities **105** may communicate with the core network **130**, or with one another, or both. For example, network entities **105** may communicate with the core network **130** via one or more backhaul communication links **120** (e.g., in accordance with an S1, N2, N3, or other interface protocol). In some examples, network entities **105** may communicate with one another via a backhaul communication link **120** (e.g., in accordance with an X2, Xn, or other interface protocol) either directly (e.g., directly between network entities **105**) or indirectly (e.g., via a core network **130**). In some examples, network entities **105** may communicate with one another via a midhaul communication link **162** (e.g., in accordance with a midhaul interface protocol) or a fronthaul communication link **168** (e.g., in accordance with a fronthaul interface protocol), or any combination thereof. The backhaul communication links **120**, midhaul communication links **162**, or fronthaul communication links **168** may be or include one or more wired links (e.g., an electrical link, an optical fiber link), one or more wireless links (e.g., a radio link, a wireless optical link), among other examples or various combinations thereof. A UE **115** may communicate with the core network **130** via a communication link **155**.

[0046] One or more of the network entities **105** described herein may include or may be referred to as a base station **140** (e.g., a base transceiver station, a radio base station, an NR base station, an access point, a radio transceiver, a NodeB, an eNodeB (eNB), a next-generation NodeB or a giga-NodeB (either of which may be referred to as a gNB), a 5G NB, a next-generation eNB (ng-eNB), a Home NodeB, a Home eNodeB, or other suitable terminology). In some examples, a network entity **105** (e.g., a base station **140**) may be implemented in an aggregated (e.g., monolithic, standalone) base station architecture, which may be configured to utilize a protocol stack that is physically or logically integrated within a single network entity **105** (e.g., a single RAN node, such as a base station **140**).

[0047] In some examples, a network entity **105** may be implemented in a disaggregated architecture (e.g., a disaggregated base station architecture, a disaggregated RAN architecture), which may be configured to utilize a protocol stack that is physically or logically distributed among two or more network entities **105**, such as an integrated access backhaul (IAB) network, an open RAN (O-RAN) (e.g., a network configuration sponsored by the O-RAN Alliance), or a virtualized RAN (vRAN) (e.g., a cloud RAN (C-RAN)). For example, a network entity **105** may include one or more of a central unit (CU) **160**, a distributed unit (DU) **165**, a radio unit (RU) **170**, a RAN Intelligent Controller (RIC) **175** (e.g., a Near-Real Time RIC (Near-RT RIC), a Non-Real Time RIC (Non-RT RIC)), a Service Management and Orchestration (SMO) **180** system, or any combination thereof. An RU **170** may also be referred to as a radio head, a smart radio head, a remote radio head (RRH), a remote radio unit (RRU), or a transmission reception point (TRP). One or more components of the network entities **105** in a disaggregated RAN architecture may be co-located, or one or more components of the network entities **105** may be located in distributed locations (e.g., separate physical locations). In some examples, one or more network entities **105** of a disaggregated RAN architecture may be implemented as virtual units (e.g., a virtual CU (VCU), a virtual DU (VDU), a virtual RU (VRU)).

[0048] The split of functionality between a CU **160**, a DU **165**, and an RU **170** is flexible and may support different functionalities depending on which functions (e.g., network layer functions, protocol layer functions, baseband functions, RF functions, and any combinations thereof) are performed at a CU **160**, a DU **165**, or an RU **170**. For example, a functional split of a protocol stack may be employed between a CU **160** and a DU **165** such that the CU **160** may support one or more layers of the protocol stack and the DU **165** may support one or more different layers of the protocol stack. In some examples, the CU **160** may host upper protocol layer (e.g., layer 3 (L3), layer 2 (L2)) functionality and signaling (e.g., Radio Resource Control

(RRC), service data adaption protocol (SDAP), Packet Data Convergence Protocol (PDCP)). The CU **160** may be connected to one or more DUs **165** or RUs **170**, and the one or more DUs **165** or RUs **170** may host lower protocol layers, such as layer 1 (L1) (e.g., physical (PHY) layer) or L2 (e.g., radio link control (RLC) layer, medium access control (MAC) layer) functionality and signaling, and may each be at least partially controlled by the CU **160**. Additionally, or alternatively, a functional split of the protocol stack may be employed between a DU **165** and an RU **170** such that the DU **165** may support one or more layers of the protocol stack and the RU **170** may support one or more different layers of the protocol stack. The DU **165** may support one or multiple different cells (e.g., via one or more RUs **170**). In some cases, a functional split between a CU **160** and a DU **165**, or between a DU **165** and an RU **170** may be within a protocol layer (e.g., some functions for a protocol layer may be performed by one of a CU **160**, a DU **165**, or an RU **170**, while other functions of the protocol layer are performed by a different one of the CU **160**, the DU **165**, or the RU **170**). A CU **160** may be functionally split further into CU control plane (CU-CP) and CU user plane (CU-UP) functions. A CU **160** may be connected to one or more DUs **165** via a midhaul communication link **162** (e.g., F1, F1-c, F1-u), and a DU **165** may be connected to one or more RUs **170** via a fronthaul communication link **168** (e.g., open fronthaul (FH) interface). In some examples, a midhaul communication link **162** or a fronthaul communication link **168** may be implemented in accordance with an interface (e.g., a channel) between layers of a protocol stack supported by respective network entities **105** that are in communication via such communication links.

[0049] In wireless communications systems (e.g., wireless communications system **100**), infrastructure and spectral resources for radio access may support wireless backhaul link capabilities to supplement wired backhaul connections, providing an IAB network architecture (e.g., to a core network **130**). In some cases, in an IAB network, one or more network entities **105** (e.g., IAB nodes **104**) may be partially controlled by each other. One or more IAB nodes **104** may be referred to as a donor entity or an IAB donor. One or more DUs **165** or one or more RUs **170** may be partially controlled by one or more CUs **160** associated with a donor network entity **105** (e.g., a donor base station **140**). The one or more donor network entities **105** (e.g., IAB donors) may be in communication with one or more additional network entities **105** (e.g., IAB nodes **104**) via supported access and backhaul links (e.g., backhaul communication links **120**). IAB nodes **104** may include an IAB mobile termination (IAB-MT) controlled (e.g., scheduled) by DUs **165** of a coupled IAB donor. An IAB-MT may include an independent set of antennas for relay of communications with UEs **115**, or may share the same antennas (e.g., of an RU **170**) of an IAB node **104** used for access via the DU **165** of the IAB node **104** (e.g., referred to as virtual IAB-MT (vIAB-MT)). In some examples, the IAB nodes **104** may include DUs **165** that support communication links with additional entities (e.g., IAB nodes **104**, UEs **115**) within the relay chain or configuration of the access network (e.g., downstream). In such cases, one or more components of the disaggregated RAN architecture (e.g., one or more IAB nodes **104** or components of IAB nodes **104**) may be configured to operate according to the techniques described herein.

[0050] In the case of the techniques described herein applied in the context of a disaggregated RAN architecture, one or more components of the disaggregated RAN architecture may be configured to support successive DPoD correction as described herein. For example, some operations described as being performed by a UE **115** or a network entity **105** (e.g., a base station **140**) may additionally, or alternatively, be performed by one or more components of the disaggregated RAN architecture (e.g., IAB nodes **104**, DUs **165**, CUs **160**, RUs **170**, RIC **175**, SMO **180**).

[0051] A UE **115** may include or may be referred to as a mobile device, a wireless device, a remote device, a handheld device, or a subscriber device, or some other suitable terminology, where the "device" may also be referred to as a unit, a station, a terminal, or a client, among other examples. A UE **115** may also include or may be referred to as a personal electronic device such as a cellular phone, a personal digital assistant (PDA), a tablet computer, a laptop computer, or a personal computer. In some examples, a UE **115** may include or be referred to as a wireless local loop (WLL) station, an Internet of Things (IoT) device, an Internet of Everything (IoE) device, or a machine type communications (MTC) device, among other examples, which may be implemented in various objects such as appliances, or vehicles, meters, among other examples.

[0052] The UEs **115** described herein may be able to communicate with various types of devices, such as other UEs **115** that may sometimes act as relays as well as the network entities **105** and the network equipment including macro eNBs or gNBs, small cell eNBs or gNBs, or relay base stations, among other examples, as shown in FIG. **1**.

[0053] The UEs **115** and the network entities **105** may wirelessly communicate with one another via one or more communication links **125** (e.g., an access link) using resources associated with one or more carriers. The term "carrier" may refer to a set of RF spectrum resources having a defined physical layer structure for supporting the communication links **125**. For example, a carrier used for a communication link **125** may include a portion of a RF spectrum band (e.g., a bandwidth part (BWP)) that is operated according to one or more physical layer channels for a given radio access technology (e.g., LTE, LTE-A, LTE-A Pro, NR). Each physical layer channel may carry acquisition signaling (e.g., synchronization signals, system information), control signaling that coordinates operation for the carrier, user data, or other signaling. The wireless communications system **100** may support communication with a UE **115** using carrier aggregation or multi-carrier operation. A UE **115** may be configured with multiple downlink component carriers and one or more uplink component carriers according to a carrier aggregation configuration. Carrier aggregation may be used with both frequency division duplexing (FDD) and time division duplexing (TDD) component carriers. Communication between a network entity **105** and other devices may refer to communication between the devices and any portion (e.g., entity, sub-entity) of a network entity **105**. For example, the terms "transmitting," "receiving," or "communicating," when referring to a network entity **105**, may refer to any portion of a network entity **105** (e.g., a base station **140**, a CU **160**, a DU **165**, a RU **170**) of a RAN communicating with another device (e.g., directly or via one or more other network entities **105**).

[0054] In some examples, such as in a carrier aggregation configuration, a carrier may also have acquisition signaling or control signaling that coordinates operations for other carriers. A carrier may be associated with a frequency channel (e.g., an evolved universal mobile telecommunication system terrestrial radio access (E-UTRA) absolute RF channel number (EARFCN)) and may be identified according to a channel raster for discovery by the UEs **115**. A carrier may be operated in a standalone mode, in which case initial acquisition and connection may be conducted by the UEs **115** via the carrier, or the carrier may be operated in a non-standalone mode, in which case a connection is anchored using a different carrier (e.g., of the same or a different radio access technology).

[0055] The communication links **125** shown in the wireless communications system **100** may include downlink transmissions (e.g., forward link transmissions) from a network entity **105** to a UE **115**, uplink transmissions (e.g., return link transmissions) from a UE **115** to a network entity **105**, or both, among other configurations of transmissions. Carriers may carry downlink or uplink communications (e.g., in an FDD mode) or may be configured to carry downlink and uplink communications (e.g., in a TDD mode).

[0056] A carrier may be associated with a particular bandwidth of the RF spectrum and, in some examples, the carrier bandwidth may be referred to as a "system bandwidth" of the carrier or the wireless communications system **100**. For example, the carrier bandwidth may be one of a set of bandwidths for carriers of a particular radio access technology (e.g., 1.4, 3, 5, 10, 15, 20, 40, or 80 megahertz (MHz)). Devices of the wireless communications system **100** (e.g., the network entities **105**, the UEs **115**, or both) may have hardware configurations that support communications using a particular carrier bandwidth or may be configurable to support communications using one of a set of carrier bandwidths. In some examples, the wireless communications system **100** may include network entities **105** or UEs **115** that support concurrent communications using carriers associated with multiple carrier bandwidths. In some examples, each served UE **115** may be configured for operating using portions (e.g., a sub-band, a BWP) or all of a carrier bandwidth.

[0057] Signal waveforms transmitted via a carrier may be made up of multiple subcarriers (e.g., using multi-carrier modulation (MCM) techniques such as orthogonal frequency division multiplexing (OFDM) or discrete Fourier transform spread OFDM (DFT-S-OFDM)). In a system employing MCM techniques, a resource element may refer to resources of one symbol period (e.g., a duration of one modulation symbol) and one subcarrier, in which case the symbol period and subcarrier spacing may be inversely related. The quantity of bits carried by each resource element may depend on the modulation scheme (e.g., the order of the modulation scheme, the coding rate of the modulation scheme, or both), such that a relatively higher quantity of resource elements (e.g., in a transmission duration) and a relatively higher order of a modulation scheme may correspond to a relatively higher rate of communication. A wireless communications resource may refer to a combination of an RF spectrum resource, a time resource, and a spatial resource (e.g., a spatial layer, a beam), and the use of multiple spatial resources may increase the data rate or data integrity for communications with a UE **115**.

[0058] One or more numerologies for a carrier may be supported, and a numerology may include a subcarrier spacing (Δf) and a cyclic prefix. A carrier may be divided into one or more BWPs having the same or different numerologies. In some examples, a UE **115** may be configured with multiple BWPs. In some examples, a single BWP for a carrier may be active at a given time and communications for the UE **115** may be restricted to one or more active BWPs.

[0059] The time intervals for the network entities **105** or the UEs **115** may be expressed in multiples of a basic time unit which may, for example, refer to a sampling period of $TS=1/(\Delta f_{max}-N_f)$ seconds, for which Δf_{max} may represent a supported subcarrier spacing, and N_f may represent a supported discrete Fourier transform (DFT) size. Time intervals of a communications resource may be organized according to radio frames each having a specified duration (e.g., 10 milliseconds (ms)). Each radio frame may be identified by a system frame number (SFN) (e.g., ranging from 0 to 1023).

[0060] Each frame may include multiple consecutively-numbered subframes or slots, and each subframe or slot may have the same duration. In some examples, a frame may be divided (e.g., in the time domain) into subframes, and each subframe may be further divided into a quantity of slots. Alternatively, each frame may include a variable quantity of slots, and the quantity of slots may depend on subcarrier spacing. Each slot may include a quantity of symbol periods (e.g., depending on the length of the cyclic prefix prepended to each symbol period). In some wireless communications systems **100**, a slot may further be divided into multiple mini-slots associated with one or more symbols. Excluding the cyclic prefix, each symbol period may be associated with one or more (e.g., N_f) sampling periods. The duration of a symbol period may depend on the subcarrier spacing or frequency band of operation.

[0061] A subframe, a slot, a mini-slot, or a symbol may be the smallest scheduling unit (e.g., in the time domain) of the wireless communications system **100** and may be referred to as a transmission time interval (TTI). In some examples, the TTI duration (e.g., a quantity of symbol periods in a TTI) may be variable. Additionally, or alternatively, the smallest scheduling unit of the wireless communications system **100** may be dynamically selected (e.g., in bursts of shortened TTIs (sTTIs)).

[0062] Physical channels may be multiplexed for communication using a carrier according to various techniques. A physical control channel and a physical data channel may be multiplexed for signaling via a downlink carrier, for example, using one or more of time division multiplexing (TDM) techniques, frequency division multiplexing (FDM) techniques, or hybrid TDM-FDM techniques. A control region (e.g., a control resource set (CORESET)) for a physical control channel may be defined by a set of symbol periods and may extend across the system bandwidth or a subset of the system bandwidth of the carrier. One or more control regions (e.g., CORESETs) may be configured for a set of the UEs **115**. For example, one or more of the UEs **115** may monitor or search control regions for control information according to one or more search space sets, and each search space set may include one or multiple control channel candidates in one or more aggregation levels arranged in a cascaded manner. An aggregation level for a control channel candidate may refer to an amount of control channel resources (e.g., control channel elements (CCEs)) associated with encoded information for a control information format having a given payload size. Search space sets may include common search space sets configured for sending control information to multiple UEs **115** and UE-specific search space sets for sending control information to a specific UE **115**.

[0063] A network entity **105** may provide communication coverage via one or more cells, for example a macro cell, a small cell, a hot spot, or other types of cells, or any combination thereof. The term "cell" may refer to a logical communication entity used for communication with a network entity **105** (e.g., using a carrier) and may be associated with an identifier for distinguishing neighboring cells (e.g., a physical cell identifier (PCID), a virtual cell identifier (VCID), or others). In some examples, a cell also may refer to a coverage area **110** or a portion of a coverage area **110** (e.g., a sector) over which the logical communication entity operates. Such cells may range from smaller areas (e.g., a structure, a subset of structure) to larger areas depending on various factors such as the capabilities of the network entity **105**. For example, a cell may be or include a building, a subset of a building, or exterior spaces between or overlapping with coverage areas **110**, among other examples.

[0064] In some examples, a network entity **105** (e.g., a base station **140**, an RU **170**) may be movable and therefore provide communication coverage for a moving coverage area **110**. In some examples, different coverage areas **110** associated with different technologies may overlap, but the different coverage areas **110** may be supported by the same network entity **105**. In some other examples, the overlapping coverage areas **110** associated with different technologies may be supported by different network entities **105**. The wireless communications system **100** may include, for example, a heterogeneous network in which different types of the network entities **105** provide coverage for various coverage areas **110** using the same or different radio access technologies.

[0065] The wireless communications system **100** may be configured to support ultra-reliable communications or low-latency communications, or various combinations thereof. For example, the wireless communications system **100** may be configured to support ultra-reliable low-latency communications (URLLC). The UEs **115** may be designed to support ultra-reliable, low-latency, or critical functions. Ultra-reliable communications may include private communication or group communication and may be supported by one or more services such as push-to-talk, video, or data. Support for ultra-reliable, low-latency functions may include prioritization of services, and such services may be used for public safety or general commercial applications. The terms ultra-reliable, low-latency, and ultra-reliable low-latency may be used interchangeably herein.

[0066] In some examples, a UE **115** may be configured to support communicating directly with other UEs **115** via a device-to-device (D2D) communication link **135** (e.g., in accordance with a peer-to-peer (P2P), D2D, or sidelink protocol). In some examples, one or more UEs **115** of a group that are performing D2D communications may be within the coverage area **110** of a network entity **105** (e.g., a base station **140**, an RU **170**), which may support aspects of such D2D communications being configured by (e.g., scheduled by) the network entity **105**. In some examples, one or more UEs **115** of such a group may be outside the coverage area **110** of a network entity **105** or may be otherwise unable to or not configured to receive transmissions from a network entity **105**. In some examples, groups of the UEs **115** communicating via D2D communications may support a one-to-many (1:M) system in which each UE **115** transmits to each of the other UEs **115** in the group. In some examples, a network entity **105** may facilitate the scheduling of resources for D2D communications. In some other examples, D2D communications may be carried out between the UEs **115** without an involvement of a network entity **105**.

[0067] In some systems, a D2D communication link **135** may be an example of a communication channel, such as a sidelink communication channel, between vehicles (e.g., UEs **115**). In some examples, vehicles may communicate using vehicle-to-everything (V2X) communications, vehicle-to-vehicle (V2V) communications, or some combination of these. A vehicle may signal information related to traffic conditions, signal scheduling, weather, safety, emergencies, or any other information relevant to a V2X system. In some examples, vehicles in a V2X system may communicate with roadside infrastructure, such as roadside units, or with the network via one or more network nodes (e.g., network entities **105**, base stations **140**, RUs **170**) using vehicle-to-network (V2N) communications, or with both.

[0068] The core network **130** may provide user authentication, access authorization, tracking, Internet Protocol (IP) connectivity, and other access, routing, or mobility functions. The core network **130** may be an evolved packet core (EPC) or 5G core (5GC), which may include at least one control plane entity that manages access and mobility (e.g., a mobility management entity (MME), an access and mobility management function (AMF)) and at least one user plane entity that routes packets or interconnects to external networks (e.g., a serving gateway (S-GW), a Packet Data Network (PDN) gateway (P-GW), or a user plane function (UPF)). The control plane entity may manage non-access stratum (NAS) functions such as mobility, authentication, and bearer management for the UEs **115** served by the network entities **105** (e.g., base stations **140**) associated with the core network **130**. User IP packets may be transferred through the user plane entity, which may provide IP address allocation as well as other functions. The user plane entity may be connected to IP services **150** for one or more network operators. The IP services **150** may include access to the Internet, Intranet(s), an IP Multimedia Subsystem (IMS), or a Packet-Switched Streaming Service.

[0069] The wireless communications system **100** may operate using one or more frequency bands, which may be in the range of 300 megahertz (MHz) to 300 gigahertz (GHz). Generally, the region from 300 MHz to 3 GHz is known as the ultra-high frequency (UHF) region or decimeter band because the wavelengths range from approximately one decimeter to one meter in length. UHF waves may be blocked or redirected by buildings and environmental features, which may be referred to as clusters, but the waves may penetrate structures sufficiently for a macro cell to provide service to the UEs **115** located indoors. Communications using UHF waves may be associated with smaller antennas and shorter ranges (e.g., less than 100 kilometers) compared to communications using the smaller frequencies and longer waves of the high frequency (HF) or very high frequency (VHF) portion of the spectrum below 300 MHz.

[0070] The wireless communications system **100** may utilize both licensed and unlicensed RF spectrum bands. For example, the wireless communications system **100** may employ License Assisted Access (LAA), LTE-Unlicensed

(LTE-U) radio access technology, or NR technology using an unlicensed band such as the 5 GHz industrial, scientific, and medical (ISM) band. While operating using unlicensed RF spectrum bands, devices such as the network entities **105** and the UEs **115** may employ carrier sensing for collision detection and avoidance. In some examples, operations using unlicensed bands may be based on a carrier aggregation configuration in conjunction with component carriers operating using a licensed band (e.g., LAA). Operations using unlicensed spectrum may include downlink transmissions, uplink transmissions, P2P transmissions, or D2D transmissions, among other examples.

[0071] A network entity **105** (e.g., a base station **140**, an RU **170**) or a UE **115** may be equipped with multiple antennas, which may be used to employ techniques such as transmit diversity, receive diversity, multiple-input multiple-output (MIMO) communications, or beamforming. The antennas of a network entity **105** or a UE **115** may be located within one or more antenna arrays or antenna panels, which may support MIMO operations or transmit or receive beamforming. For example, one or more base station antennas or antenna arrays may be co-located at an antenna assembly, such as an antenna tower. In some examples, antennas or antenna arrays associated with a network entity **105** may be located at diverse geographic locations. A network entity **105** may include an antenna array with a set of rows and columns of antenna ports that the network entity **105** may use to support beamforming of communications with a UE **115**. Likewise, a UE **115** may include one or more antenna arrays that may support various MIMO or beamforming operations. Additionally, or alternatively, an antenna panel may support RF beamforming for a signal transmitted via an antenna port.

[0072] The network entities **105** or the UEs **115** may use MIMO communications to exploit multipath signal propagation and increase spectral efficiency by transmitting or receiving multiple signals via different spatial layers. Such techniques may be referred to as spatial multiplexing. The multiple signals may, for example, be transmitted by the transmitting device via different antennas or different combinations of antennas. Likewise, the multiple signals may be received by the receiving device via different antennas or different combinations of antennas. Each of the multiple signals may be referred to as a separate spatial stream and may carry information associated with the same data stream (e.g., the same codeword) or different data streams (e.g., different codewords). Different spatial layers may be associated with different antenna ports used for channel measurement and reporting. MIMO techniques include single-user MIMO (SU-MIMO), for which multiple spatial layers are transmitted to the same receiving device, and multiple-user MIMO (MU-MIMO), for which multiple spatial layers are transmitted to multiple devices.

[0073] Beamforming, which may also be referred to as spatial filtering, directional transmission, or directional reception, is a signal processing technique that may be used at a transmitting device or a receiving device (e.g., a network entity **105**, a UE **115**) to shape or steer an antenna beam (e.g., a transmit beam, a receive beam) along a spatial path between the transmitting device and the receiving device. Beamforming may be achieved by combining the signals communicated via antenna elements of an antenna array such that some signals propagating along particular orientations with respect to an antenna array experience constructive interference while others experience destructive interference. The adjustment of signals communicated via the antenna elements may include a transmitting device or a receiving device applying amplitude offsets, phase offsets, or both to signals carried via the antenna elements associated with the device. The adjustments associated with each of the antenna elements may be defined by a beamforming weight set associated with a particular orientation (e.g., with respect to the antenna array of the transmitting device or receiving device, or with respect to some other orientation).

[0074] A network entity **105** or a UE **115** may use beam sweeping techniques as part of beamforming operations. For example, a network entity **105** (e.g., a base station **140**, an RU **170**) may use multiple antennas or antenna arrays (e.g., antenna panels) to conduct beamforming operations for directional communications with a UE **115**. Some signals (e.g., synchronization signals, reference signals, beam selection signals, or other control signals) may be transmitted by a network entity **105** multiple times along different directions. For example, the network entity **105** may transmit a signal according to different beamforming weight sets associated with different directions of transmission. Transmissions along different beam directions may be used to identify (e.g., by a transmitting device, such as a network entity **105**, or by a receiving device, such as a UE **115**) a beam direction for later transmission or reception by the network entity **105**.

[0075] Some signals, such as data signals associated with a particular receiving device, may be transmitted by transmitting device (e.g., a transmitting network entity **105**, a transmitting UE **115**) along a single beam direction (e.g., a direction associated with the receiving device, such as a receiving network entity **105** or a receiving UE **115**). In some examples, the beam direction associated with transmissions along a single beam direction may be determined based on a signal that was transmitted along one or more beam directions. For example, a UE **115** may receive one or more of the signals transmitted by the network entity **105** along different directions and may report to the network entity **105** an indication of the signal that the UE **115** received with a highest signal quality or an otherwise acceptable signal quality.

[0076] In some examples, transmissions by a device (e.g., by a network entity **105** or a UE **115**) may be performed using multiple beam directions, and the device may use a combination of digital precoding or beamforming to generate a combined beam for transmission (e.g., from a network entity **105** to a UE **115**). The UE **115** may report feedback that indicates precoding weights for one or more beam directions, and the feedback may correspond to a configured set of beams across a system bandwidth or one or more sub-bands. The network entity **105** may transmit a reference signal (e.g., a cell-specific reference signal (CRS), a channel state information reference signal (CSI-RS)), which may be precoded or unprecoded. The UE **115** may provide feedback for beam selection, which may be a precoding matrix indicator (PMI) or codebook-based feedback (e.g., a multi-panel type codebook, a linear combination type codebook, a port selection type codebook). Although these techniques are described with reference to signals transmitted along one or more directions by a network entity **105** (e.g., a base station **140**, an RU **170**), a UE **115** may employ similar techniques for transmitting signals multiple times along different directions (e.g., for identifying a beam direction for subsequent transmission or reception by the UE **115**) or for transmitting a signal along a single direction (e.g., for transmitting data to a receiving device).

[0077] A receiving device (e.g., a UE **115**) may perform reception operations in accordance with multiple receive configurations (e.g., directional listening) when receiving various signals from a transmitting device (e.g., a network entity **105**), such as synchronization signals, reference signals, beam selection signals, or other control signals. For example, a receiving device may perform reception in accordance with multiple receive directions by receiving via different antenna subarrays, by processing received signals according to different antenna subarrays, by receiving according to different receive beamforming weight sets (e.g., different directional listening weight sets) applied to signals received at multiple antenna elements of an antenna array, or by processing received signals according to different receive beamforming weight sets applied to signals received at multiple antenna elements of an antenna array, any of which may be referred to as "listening" according to different receive configurations or receive directions. In some examples, a receiving device may use a single receive configuration to receive along a single beam direction (e.g., when receiving a data signal). The single receive configuration may be aligned along a beam direction determined based on listening according to different receive configuration directions (e.g., a beam direction determined to have a highest signal strength, highest signal-to-noise ratio (SNR), or otherwise acceptable signal quality based on listening according to multiple beam directions).

[0078] The UEs **115** and the network entities **105** may support retransmissions of data to increase the likelihood that data is received successfully. Hybrid automatic repeat request (HARQ) feedback is one technique for increasing the likelihood that data is received correctly via a communication link (e.g., a communication link **125**, a D2D communication link **135**). HARQ may include a combination of error detection (e.g., using a cyclic redundancy check (CRC)), forward error correction (FEC), and retransmission (e.g., automatic repeat request (ARQ)). HARQ may improve throughput at the MAC layer in poor radio conditions (e.g., low signal-to-noise conditions). In some examples, a device may support same-slot HARQ feedback, in which case the device may provide HARQ feedback in a specific slot for data received via a previous symbol in the slot. In some other examples, the device may provide HARQ feedback in a subsequent slot, or according to some other time interval.

[0079] As described herein, the wireless communications system **100** may support a successive DPoD correction process to reduce complexity, decrease latency, and improve performance in communications between devices. For example, a UE **115** may determine a batch size for subsets of a larger quantity of transmission lanes of a network entity **105** used to transmit a signal, and may indicate this batch size. Based on the batch size, the network entity **105** may schedule complex non-linear correction at the UE **115** for each of the subsets during successive sub-iterations of a larger iteration related to the transmission lanes. The UE may further perform simpler estimations for remaining transmission lane processes that are not part of a selected subset during a given sub-iteration. For example, simpler estimations may be based on a previous non-linear estimation, or may include one or more scalar estimations.

[0080] FIG. **2** shows an example of a DPoD correction scheme **200** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The DPoD correction scheme **200** may implement or be implemented to realize aspects of the wireless communications system **100**. For example, the DPoD correction scheme **200** may illustrate one or more processes performed at a UE **115** as part of an iterative DPoD correction process to correct non-linear distortion in a signal received from a network entity **105**. In some examples, the DPoD correction scheme **200** may support a successive DPoD correction process to reduce complexity, decrease latency, and improve performance in non-linear distortion correction at a UE **115**.

[0081] For example, DPoD may be used at a UE **115** to correct non-linear distortion in a received signal output by a network entity **105**. Notably, a power amplifier may be an example of a relatively power hungry component of a network entity, and so designing a power amplifier to be operable even with relatively low or reduced power consumption may be prioritized for some network entities, UEs, or other devices. For example, a supply voltage to a power amplifier may be lowered to reduce power consumption in systems where power savings may be prioritized (e.g., Green Networks). However, as power consumption decreases, it may result in a smaller or less robust linearity region for the power amplifier, and may consequently add non-linear distortion to one or more signal transmissions. For example, reducing a supply voltage of a power amplifier of a network entity **105** may increase a non-linear relationship between the input and output of the power amplifier, subsequently introducing non-linear distortion into an amplitude or a phase of signals transmitted by the network entity **105**. In some examples, such distortion may be represented by an added amplitude-amplitude (AM) distortion or an added amplitude-phase (PM) distortion applied to a transfer function of the power amplifier, which may add non-linearity distortion corrupting error to transmitted signals.

[0082] In some cases, UEs **115** or other devices may mitigate non-linear distortion by performing DPoD correction to a received signal (e.g., a downlink signal from a network entity **105**). A DPoD correction process may involve estimating a power amplifier coefficients model that may represent a non-linearity introduced by the power amplifier to a transmitted signal. This estimation may be done iteratively along with channel estimation using broadcasted pilot signals (e.g., reference signals). For example, in addition to performing channel estimation in DPoD using a demodulation reference signal (DMRS), a UE **115** may also perform estimation of a related power amplifier non-linear model and its effect on the same DMRS signal. The DPoD process may also include a data (e.g., from a physical downlink shared channel (PDSCH) message) processing stage at which the non-linear distortion within the data is corrected (e.g., removed, suppressed) by subtracting the estimated distortion iteratively from the original signal. This distortion may be reconstructed by applying the estimated power amplifier model on the hard decisions on the received equalized data to estimate an original signal and corresponding effect from the power amplifier. DPoD Processes may also utilize a same codebook precoder, which may be updated each time a CSI-RS is received, as part of the reconstruction chain in order to reconstruct the distortion in the transmission domain, where it is originally generated. In some cases, these steps for signal estimation and distortion correction may be illustrated by steps **205** through **230** of the DPoD correction scheme **200**.

[0083] For example, a UE **115** may receive a signal x(t) using one or more antennas (e.g., in the receive, Rx, domain), where x(t) may represent an original signal y(t) output by the network entity **105** including distortion from a corresponding channel H. The UE **115** may convert the signal x(t) to the frequency domain using a Fast Fourier Transform (FFT) (or other Fourier transform) to produce X(f) and may perform equalization at **210** represented by $H^{-1}(X(f))$ to remove the effects of the channel H in which the signal x(t) was received. In a "layers" domain, the UE **115** may "slice" the signal (e.g., using a slicer or demodulation device) at **215**, or in other words, may perform hard decisions using the signal to determine a sequence of bits corresponding to modulated symbols of the received signal x(t). The result of the slicing may output a discrete signal X[k]. In some cases, slicing may be performed according to a corresponding modulation scheme with which the signal y(t) was originally transmitted. The output X[k] may thus represent the original message as demodulated by the UE **115** in the frequency domain, which may still include errors due to non-linear distortion from the network entity **115** power amplifier. For example, some discrete values of X[k] may be different (e.g., correspond to different bits) than the signal that was originally intended (e.g., before amplification and transmission of y(t)) due to the non-linear error in X(f).

[0084] The UE **115** may estimate the originally transmitted signal y(t) by treating the signal X[k] as an input and representing an originally modulated signal before amplification and transmission by the network entity **105**. For example, at **220**, the UE **115** may perform a precoding operation on X[k] using a same precoder as used by the network entity **105** (e.g., to generate y(t)). At **225**, the UE **115** may further perform one or more estimation processes **227** on the precoded signal to simulate the same transmitted signal (e.g., in a transmission, Tx, domain) and to estimate the effect of the power amplifier on the signal X[k] during transmission. For example, the UE **115** may utilize one or more processes to perform non-linear projection of a corresponding portion of X[k](e.g., a symbol of a modulated transmission) using estimation processes **227**-*a* through **227**-N_tx. Notably, the quantity Nx may correspond to a same quantity of transmission lanes (e.g., including respective circuitry and antennas) used by the network entity **105** to transmit the signal y(t). Thus, the UE **115** may estimate the specific non-linear distortion introduced by the power amplifier for each transmission lane of the network entity **105**.

[0085] In some examples, a non-linear projection of X[k] may be illustrated by the non-linear projection block **228**, which may otherwise be referred to as a kernel projection block. For example, at **229**-*a*, X[k] may be converted to the time domain using an inverse FFT (IFFT) to produce x[n]. At **229**-*b*, a kernel projection may be performed on x[n] to estimate the corresponding non-linear distortion for each transmission lane, which may include a power amplifier coefficients cn component. This projection may be done for each transmission lane, where the result as generated by kernel projection may be represented by Equation 1 below.

$$\sum_{n=1}^{N_{tx}} c_n x[n] |x[n]|^{2n} \tag{1}$$

[0086] Notably, as the sum is from n=1 to N_{tx}, the result may output an estimate of the distortion included in the original signal y(t) with the original signal removed, so the distortion is all that remains (e.g., y(t) would correspond to n=0). At **229**-*c* the estimated distortion may be converted back into the frequency domain using an FFT.

[0087] Once the estimation of the non-linear distortion is complete, the result may be output to **230**, where H_{phy} may be applied to output the full estimated distortion after transmission through the channel H, and the estimation may be complete. The UE **115** may then subtract the estimated distortion from the received signal x(t) at **206**, which may at least partially correct the signal x[t] based on the estimation. The UE **115** may iterate the DPoD scheme **200** over multiple iterations using the output of each previous iteration as the input to a next iteration to iteratively remove an effect of distortion on the signal x(t). Once the correct signal satisfies (e.g., is equal to, is greater than, is less than, depending on threshold) a targeted threshold (e.g., receive power or quality), the signal may be passed onto a decoding stage after a final equalization procedure and slicing procedure are done to determine the final demodulated signal.

[0088] For N_{tx} transmission lanes at the network entity **105**, the UE **115** may perform N_{tx} non-linear projection procedures in parallel. As each kernel projection block may include IFFT, kernel projection, and FFT for each lane estimation, each single projection process may have a complexity of $O(N_{FFT} \cdot \log_2 N_{FFT})$. For a value of N_{tx} transmission lanes (e.g., N_{tx} antennas) and N_{tx} corresponding projection blocks, the complexity becomes $O(N_{tx} \cdot N_{FFT} \cdot \log_2 N_{FFT})$, and for a total of Niter iterations, a total complexity of the DPoD correction phase for the signal x(t) may be $O(N_{FFT} \cdot N_t \cdot N_{FFT} \cdot \log_2 N_{FFT})$. Notably, as a quantity of transmission lanes and antennas of a network entity **105** increases (e.g., during massive MIMO), a DPoD algorithm at the UE **115** may incur penalty in both an increased implementation complexity (due to increase in FFT and IFFT operations), which may result in increased UE power consumption and latency in communications. Further, for N_{tx} non-linear projections, the receiver of the UE **115** would use N_{tx} IFFT/FFT blocks in parallel, which for higher N_{tx} values may be limited by a quantity of available IFFT/FFT blocks of the UE **115**.

[0089] As described herein, one or more devices operable to perform DPoD using the DPoD scheme **200** may additionally or alternatively support a successive DPoD correction process to reduce complexity, decrease latency, and improve performance in communications between devices. For example, a UE **115** may perform complex non-linear projection for a subset of transmission lanes of a network entity **105** using a subset of the estimation processes **227** during multiple sub-iterations to reduce a complexity of calculations at each iteration and utilize results at sooner time periods to decrease latency and increase gain in correction procedures. Additionally, the UE **115** may perform one or more simpler calculations for remaining estimation processes **227** during each sub-iteration to further increase gain and reduce latency.

[0090] FIG. **3** shows an example of a DPoD correction scheme **300** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The DPoD correction scheme **200** may implement or be implemented to realize aspects of the wireless communications system **100** and the DPoD correction scheme **200**.

For example, the DPoD correction scheme **300** may illustrate the DPoD scheme **200** including further techniques for performing subsets of a total quantity of non-linear estimation processes during sub-iterations for both complexity reduction and performance and latency improvement as described herein. For example, instead of performing N_{tx} projection operations in parallel during one or more iterations, a UE **115** may instead use smaller sub-iterations to correct a non-linear distortion in x(t) for a subset of transmission lanes at a time.

[0091] During a first sub-iteration of a DPoD process, a subset **305**-*a* of the estimation processes **227**, corresponding to a subset of the N_{tx} lanes of the network entity **105**, may involve full non-linear projections. For example, a estimation process **227**-*a* may involve a non-linear projection for a distortion for a corresponding transmission lane. In some examples, the subset **305**-*a* may correspond to a first subset of symbols of x(t). Further, multiple successive DPoD sub-iterations may correspond to a single larger iteration and may be used to perform a greater quantity of iterations for a full iterative correction process.

[0092] During the same sub-iteration, a UE **115** may estimate a remainder of the distortion for the N_{tx} lanes using simpler calculations to reduce a complexity during the sub-iteration while still performing some correction. For example, a subset **305**-*b* of the estimation processes **227** may involve estimation using a previous iteration result. In one example, an estimation process **227**-*b* of the subset **305**-*b* may be performed based on a previous full non-linear estimation performed for the same transmission lane in a previous sub-iteration. Additionally, or alternatively, one or more of the remaining estimation processes **227** may involve simple scalar calculations, including at least estimations based on a Bussgang coefficient B as described herein. For example, a scalar estimation process may be performed at an estimation process **227**-*c* of a subset **305**-*c*.

[0093] For example, a scalar coefficient B may be used to correct a scalar, or linear, component of non-linear distortion. For example, the Bussgang theorem shows that a cross correlation between two Gaussian signals is the same before and after one of the signals has passed through a non-linear function except for a scaling factor B. For example, if a signal x passes through a non-linear system U(·) (such as the power amplifier of the network entity **115**), the output signal z may be defined as z=U(x). By the Bussgang theorem, the output signal z may be decomposed as represented by Equation 2 below:

$$z = U(x) = B \cdot x + \eta \tag{2}$$

[0094] In Equation 2, ρ may be a zero-mean random variable that is uncorrelated to x, while a value of B may depend on a choice of the non-linear function U(·). The Bussgang theorem may also apply for third-order non-linearity and for MIMO systems. For non-Gaussian signals, Equation 2 may represent a generalized Bussgang decomposition for a non-Gaussian random vector x. For example, B·x may be a linear component and may represent a linear minimum mean square error (MMSE) estimate of the output signal z given a non-Gaussian distributed observation x. In contrast, ρ may be an estimation error that is uncorrelated with x, and may represent a non-linear component of the signal. In other words, by the Bussgang theorem, a distortion U(x) for an output signal z may be constructed from a linear component described by a coefficient B, and a non-linear component ρ which is uncorrelated with the input signal x.

[0095] A UE **115** may in some cases mitigate a power amplifier non-linearity at least partially by applying a scaling factor B on the received signal in the transmission domain estimation and subtracting this linear portion of the error from the received signal. The signal X(f) may be received in accordance with a modulation scheme (e.g., quadrature amplitude modulation (QAM)), which may be represented by a plot **310**-*a* as a constellation of received symbols. For example, the originally intended modulation scheme used to modulate a message transmitted in y(t) may be represented by one or more points **315** in a grid pattern which may also be the expected locations of the received points for slicing. One or more "clouds" **320** of points may represent the actual points at which symbols of x(t), and thus X(f), are received. Notably, the received signal may include non-linear distortion as represented by the difference between the locations and sizes of the clouds **320** compared to the singular expected points **315**.

[0096] Using the Bussgang theorem, the UE **115** may break down the distortion to the clouds **320** of points of the received signal into a non-linear component and a linear component. The linear component (e.g., a dominant component) may be represented by a scaling transformation of the clouds **320** compared to the points **315**, while a non-linear scattering of each of the clouds **320** may represent an effect of a non-linear transformation. This scaling may be defined by a scaling factor B, which may be calculated at the UE **115** for the received signal, for example, at the layers domain, according to Equation 3 below:

$$B = \mathrm{argmin}_b\left(|y' - b \cdot x|^2\right) \tag{3}$$

[0097] In Equation 3, y' and x may represent the received and original signal, respectively, and B may be a scalar value. By calculating B for the signals, the linear (e.g., scalar) component of the distortion may be approximated and subsequently removed from the received signal to generate the plot **310**-*b*. Notably, the plot **310**-*b* may illustrate the constellation of the received symbols after removing this scaling factor. As demonstrated in the two plots, correcting a linear portion of the signal presents a simple algorithm with low complexity that allows a significant improvement in error vector magnitude (EVM).

[0098] In some examples, a scheduling of the subsets may be determined by a network entity **105** and indicated to the UE **115**, where such schedule may be implemented at **325**. For example, at **325**, the UE **115** may implement a schedule (e.g., using a "scheduler" or scheduling component) that defines an order in which different subsets (e.g., batches) of estimation processes may be performed. A schedule may in one example indicate to perform non-linear projection for the subset **305**-*a* in a first sub-iteration, and to perform non-linear projection for another subset, for example, the subset **305**-*b* or the subset **305**-*c*, at a second iteration. In some cases, the network entity **105** may schedule subsets according to different parameters of corresponding transmission lane antennas, and may schedule to achieve a target metric achieved by a different order of corrections (e.g., faster convergence to correction, higher performance).

[0099] Scheduling a subset of transmission lane correction for each sub-iteration while performing simpler calculations in tandem may improve a quality of transmissions. For example, by using smaller sub-iterations, a next subset calculation may begin at an advanced starting point (e.g., with a better SER on slicer output due to using a previous sub-iteration instead of a previous iteration), which may speed up an overall operation and achieve a higher performance quicker. Further, performing projections for a small subset each iteration may reduce a complexity of calculations, while performing simple calculations at the same time may retain efficiency and further contribute to corrections. Additionally, scheduling each estimation process may further enhance a speed and performance in DPoD.

[0100] A complexity of a successive DPoD correction process may depend on a total quantity of sub-iterations $N_{sub\ Iter}$ and a batch size N_{batch}, with a total complexity of $O(N_{sub\ Iter} \cdot N_{batch} \cdot N_{FFT} \cdot \log_2 N_{FFT})$. Thus, an improvement factor (IF) in comparison to performing non-linear projection for all lanes simultaneously during a larger iteration may be represented by equation 4 below:

$$IF = \frac{N_{Iter} \cdot N_{tx} \cdot N_{FFT} \cdot \log_2 N_{FFT}}{N_{sub\ Iter} \cdot N_{batch} \cdot N_{FFT} \cdot \log_2 N_{FFT}} = \frac{N_{Iter} \cdot N_{tx}}{N_{sub\ Iter} \cdot N_{batch}} \quad (4)$$

[0101] FIG. **4** shows an example of a process flow **400** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The process flow **400** may implement or be implemented to realize aspects of the wireless communications system **100**, the DPoD correction scheme **200**, and the DPoD correction scheme **300**. For example, the process flow **400** may be implemented by a UE **115**-*a* and a network entity **105**-*a*, which may be examples of the corresponding devices described herein, including with reference to FIGS. **1**-**3**. In some examples, the process flow **400** may support successive DPoD correction operations using smaller subsets for complex non-linear estimation during smaller iterations to modify a correction flow of a DPoD process for lower complexity by reducing operations in the transmission domain.

[0102] In the following description of the process flow **400**, the operations may be performed (such as reported or provided) in a different order than the order shown, or the operations performed by the example devices may be performed in different orders or at different times. Some operations also may be omitted from the process flow **400**, or other operations may be added to the process flow **400**. Further, although some operations or signaling may be shown to occur at different times for discussion purposes, these operations may actually occur at the same time or at least partially concurrently.

[0103] At **405**, the UE **115**-*a* may optionally transmit, and the network entity **105**-*a* may optionally obtain (e.g., receive, obtain via one or more wireless, physical, or other mediums, obtain via one or more other devices or components), a capability message **406** indicating a capability of the UE **115** to perform a successive non-linear distortion correction process. For example, the UE **115**-*a* may indicate a capability to perform successive DPoD in the capability message **406**, which the UE **115**-*a* may transmit in uplink signaling to the network entity **105**-*a* (e.g., via physical uplink control channel (PUCCH) messaging).

[0104] At **410**, the UE **115**-*a* may transmit, and the network entity **105**-*a* may obtain, a control message **411** indicating a quantity of parallel processes supported at the UE **115**-*a* that may be associated with each of a quantity of sub-iterations of the successive non-linear distortion correction process. For example, the UE **115**-*a* may indicate a batch size in the control message **411** for sub-iterations of a successive DPoD correction process. In some examples, the quantity of parallel processes, or batch size, may correspond to a quantity of transmission lanes that may be corrected in a single sub-iteration using non-linear projection (e.g., high complexity, high accuracy correction).

[0105] In some cases, the quantity of parallel processes may indicate available transmission lanes (e.g., a quantity the UE **115**-*a* may allocate for DPoD correction that will not be in use for other operations or transmissions at the time of an estimation procedure). The quantity of parallel processes may also be based on the capability of the UE. For example, the quantity of parallel processes may correspond to a maximum quantity of processes the UE **115**-*a* may perform in parallel based on hardware constraints at the UE **115**-*a* (e.g., based on a quantity of transmission lanes and antennas that may define a total quantity of available IFFT/FFT blocks that may be performed simultaneously). The quantity of parallel processes may be further based on a threshold latency value, a threshold power value, a threshold complexity value, or any combination thereof. The control message **411** may in some cases indicate a latency, one or more devices (e.g., modems), one or more parameters for one or more receivers, among other information related to the UE **115**-*a*. Further, the control message **411** and the capability message **406** may be transmitted separately (e.g., control message **411** in via physical uplink control channel (PUCCH) messaging and a capability message in a less frequent signal), or together in a same message.

[0106] At **415**, the network entity **105**-*a* may determine a schedule for performing respective subsets of a set of non-linear estimation processes during each of the sub-iterations based on the control message **411**. For example, the network entity **105**-*a* may decide on a priority order for scheduling of correction for each antenna of the network entity **105**-*a* as descried herein. In some examples, known parameters at the network entity **105**-*a* may define a quality of transmissions by each antenna for each transmission lane (e.g., a precoder may change a root mean square (RMS) level for a quantity of antennas that are associated with a lower amplitude and lower non-linearity). For example, some antennas of the network entity **105**-*a* may have a greater impact on non-linear distortion in a message than other antennas. In some cases, an amount of non-linear distortion introduced in a signal by an antenna (and corresponding transmission lane) may be based on a power amplifier model per lane, a backoff per lane, a peak-to-average power ratio (PAPR) per lane, a transmission antenna EVM, among other parameters. The network entity **105** may schedule corresponding non-linear corrections based on such parameters.

[0107] The network entity **105**-*a* may prioritize antennas to achieve one or more objective functions. For example, to achieve faster convergence to a full non-linear distortion and correction (e.g., exceeding a threshold corrected signal power or threshold quality metric), the network entity **105**-*a* may determine a scheduling rule or correction order for sub-iteration correction. In an example, the network entity **105**-*a* may select a quantity of antennas from a total quantity of antennas equal to an indicated batch size (e.g., Ntx=8, but batch size may be 2) for correction in a first sub-iteration based on related parameters to achieve faster convergence (e.g., lanes **1** and **6** may be associated with a largest amount of non-linear distortion). The network entity **105**-*a* may also schedule additional lanes for non-linear projection in later sub-iterations that, for example, may have less of an impact on non-linear distortion (e.g., lanes **2** and **3** during sub-iteration **2**, lanes **5** and **8** during sub-iteration **3**, lanes **4** and **7** during sub-iteration **4**). A maximum batch size of the UE **115**-*a* may in some cases affect the scheduling algorithm (e.g., based on a constraint of the maximum batch size).

[0108] At **420**, the network entity **105**-*a* may output (e.g., transmit, output via one or more wireless, physical, or other mediums, output via one or more other devices or components), and the UE **115**-*a* may receive, a scheduling configuration message **421** based on the control message **411**. For example, the scheduling configuration message **421** may indicate a schedule for performing respective subsets of a set of non-linear estimation processes (e.g., non-linear projection processes) during each sub-iteration of the quantity of sub-iterations. The schedule may be based on one or more parameters associated with (e.g., may be used to estimate and effect of) one or more transmission lanes of the network entity **105**-*a* (e.g., lane-specific parameters considered at **415**). The schedule may also be based on the quantity of parallel processes supported at the UE (e.g., batch size). In some cases, the network entity **105**-*a* may output the scheduling decisions in the scheduling configuration message **421** in downlink to the UE **115**-*a* (e.g., via PDCCH).

[0109] At **425**, the network entity **105**-*a* may optionally output, and the UE **115**-*a* may optionally obtain, one or more signals **426**. For example, UE **115**-*a* may receive a first signal (e.g., x(t)) including one or more symbols (e.g., according to a modulation scheme) that may correspond to a second signal (e.g., y(t)) originally transmitted by the network entity **105**-*a* (including non-linear distortion but before transmission through a channel). For example, the first signal may be the resulting signal including effects of the channel H in which the second signal is transmitted. The first signal may be associated with the quantity of parallel processes and the quantity of sub-iterations of the successive non-linear distortion correction process. For example, the signal may represent one or more pilot symbols or data messages that may be used in a DPoD correction procedure.

[0110] At **430**, the UE **115**-*a* may perform, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. For example, the UE **115**-*a* may perform a successive DPoD process as illustrated in FIG. **3**, where performing respective subsets of the set of non-linear estimation processes may be based on estimating one or more second symbols of the second signal y(t) transmitted by the network entity **105**-*a* and corresponding to the one or more symbols of the first signal x(t). Notably, instead of estimating each signal in parallel in the transmission domain, the UE **115**-*a* may perform one of three processes for an associated symbol of x(t) in an order decided by the scheduling received at **420**.

[0111] For example, the set of non-linear estimation processes may include one or more non-linear kernel projection processes, one or more Fourier transform processes (e.g., FFT), and one or more inverse Fourier transform processes (e.g., IFFT) for full non-linear projection (e.g., having high complexity $O(N\cdot\log_2 N)$) of different subsets of a total quantity of transmission lanes and symbols to perform during each sub-iteration. The UE **115**-*a* may also perform respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations using a non-linear projection result from previous sub-iterations (e.g., no complexity). For example, each non-linear estimation process of a first subset of the second set of non-linear estimation processes may be based on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes. In such an example, the first subset may be performed during a first sub-iteration of the quantity of sub-iterations and the second subset may be performed during a second sub-iteration before the first sub-iteration.

[0112] Additionally, or alternatively, the UE **115**-*a* may perform respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process based on a scalar estimation. For example, each linear estimation process of the third set of linear estimation processes may be associated with estimating a respective scalar coefficient value (e.g., a scaling coefficient B component of non-linear distortion). The UE **115**-*a* may perform scalar estimations in some cases if a non-linear projection has not been previously applied to a lane (e.g., for a first sub-iteration in which a lane is corrected).

[0113] In some cases, the UE **115**-*a* may at least partially correct (during each sub-iteration) an amplitude and phase of a first symbol (among additional symbols of the indicated quantity of parallel processes corresponding to a batch size) of the one or more first symbols based on performing a respective subset of the set of non-linear estimation processes. For example, during non-linear projection processes, the UE **115**-*a* may estimate A/A and A/P distortion for a subset of symbols (e.g., for the indicated batch size) of the first signal during each sub-iteration using a respective transmission lane, and may subtract the estimated distortion from the first signal. In some cases, correcting amplitude and phase of the original signal may enable the UE to more effectively decode the received first signal to determine a message corresponding to an originally intended third signal (e.g., signal corresponding to modulated information before amplification adds distortion).

[0114] In some cases, a batch size may be dynamic. For example, the UE **115** may dynamically send batch sizes updated based on one or more parameters, where the network entity **105**-*a* may adjust a schedule and inform the UE accordingly, which may increase a gain and speed of a DPoD process. For example, batch size may change based on resource availability or FFTs and transmission lanes at UE that are available at a given time.

[0115] FIG. **5** shows an example of a correction schedule **500** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The correction schedule **500** may implement or be implemented to realize aspects of the wireless communications system **100**, the DPoD correction scheme **200**, the DPoD correction scheme **300**, and the process flow **400**. For example, correction schedule **500** may represent a schedule for performing different estimation procedures during each sub-iteration of a DPoD process at a UE **115**. In some cases, the correction schedule **500** may represent the schedule indicated by the scheduling configuration message **421** to the UE **115**-*a*.

[0116] For example, the correction schedule **500** may be a schedule for a total quantity of N_{tx}=4 transmission lanes **505** at the network entity **105**-*a*, including transmission lanes **505**-*a*, **505**-*b*, **505**-*c*, and **505**-*d*. The UE **115**-*a* may also indicate a batch size of 2 in the control message **411**. During a successive DPoD process, the UE **115**-*a* may correct the signal x(t) in a series of four sub-iterations **510**, including sub-iterations **510**-*a*, **510**-*b*, **510**-*c*, and **510**-*d*. In some cases, the sub-iterations **510** may represent a quantity of sub-iterations for successfully correcting non-linear distortion above a threshold correction level (e.g., to reach a threshold receive power or signal quality).

[0117] Based on the scheduling performed at **415** of FIG. **4**, the correction schedule **500** may be determined. For example, at the DPoD process, the UE **115**-*a* may perform estimations during each sub-iteration according to the schedule **500**. For example, in a first sub-iteration, the UE **115**-*a* may perform non-linear projection for a batch size of transmission lanes according to the schedule, including the lanes **505**-*c* and **505**-*d*. In some cases, the lanes **505**-*c* and **505**-*d* may be scheduled for non-linear projection during the first sub-iteration **510**-*a* based on different parameters (e.g., contributing to a greater non-linear contribution). During the same sub-iteration, the UE **115**-*a* may perform Bussgang estimations using a scalar coefficient on the lanes **505**-*a* and **505**-*b* (e.g., lanes that have not yet had non-linear projection performed). The UE **115**-*a* may subsequently correct a portion of non-linear distortion contributed by the lanes **505**-*c* and **505**-*d* while correcting a linear component of distortion to which the lanes **505**-*a* and **505**-*b* contributed.

[0118] During the second sub-iteration **510**-*b*, the schedule may indicate for the UE **115**-*a* to use a previous non-linear projection for further estimation of the lanes **505**-*c* and **505**-*d*, while the lanes **505**-*a* and **505**-*b* may at the sub-iteration **510**-*b* include non-linear complex estimations. The lanes **505** may swap between non-linear projections and utilizing previous results for the sub-iterations **510**-*c* and **510**-*d*.

[0119] By projecting a small subset during each sub-iteration, a small subset of transmission lanes **505** may be used at a time for a full NL projection (e.g., high complexity cost for high accuracy) while a remainder of transmission lanes **505** may use previous (old) NL projection or use simple Bussgang scaling. In a next sub-iteration **510**, the UE **115**-*a* may use earlier results from a previous sub-iteration, as well as perform simpler calculations in tandem, and so may achieve a higher gain and improved signal by the end of sub-iteration **510**-*d* compared to a traditional full non-linear correction process estimating all lanes during a singular iteration **515**. That is, a higher gain may be reached by the end of **510**-*d* using a same complexity. Further, as the UE **115**-*a* is able to calculate results with higher granularity and improve an overall performance, the UE **115**-*a* may reduce latency by reaching a target correction metric at a sooner period (e.g., within an iteration **515**). Additionally, selecting antennas that contribute more to gain using a schedule may further contribute to performance and latency. In some examples, such improvements in gain and latency may result in reaching a target metric before the sub-iteration **510**-*d*. In some cases, non-linear projection may not be performed on some lanes if a target metric is met in an earlier sub-iteration.

[0120] FIG. **6** shows a block diagram **600** of a device **605** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The device **605** may be an example of aspects of a UE **115** as described herein. The device **605** may include a receiver **610**, a transmitter **615**, and a communications manager **620**. The device **605**, or one or more components of the device **605** (e.g., the receiver **610**, the transmitter **615**, and the communications manager **620**), may include at least one processor, which may be coupled with at least one memory, to, individually or collectively, support or enable the described techniques. Each of these components may be in communication with one another (e.g., via one or more buses).

[0121] The receiver **610** may provide a means for receiving information such as packets, user data, control information, or any combination thereof associated with various information channels (e.g., control channels, data channels, information channels related to successive DPoD correction). Information may be passed on to other components of the device **605**. The receiver **610** may utilize a single antenna or a set of multiple antennas.

[0122] The transmitter **615** may provide a means for transmitting signals generated by other components of the device **605**. For example, the transmitter **615** may transmit information such as packets, user data, control information, or any combination thereof associated with various information channels (e.g., control channels, data channels, information channels related to successive DPoD correction). In some examples, the transmitter **615** may be co-located with a receiver **610** in a transceiver module. The transmitter **615** may utilize a single antenna or a set of multiple antennas.

[0123] The communications manager **620**, the receiver **610**, the transmitter **615**, or various combinations thereof or various components thereof may be examples of means for performing various aspects of successive DPoD correction as described herein. For example, the communications manager **620**, the receiver **610**, the transmitter **615**, or various combinations or components thereof may be capable of performing one or more of the functions described herein.

[0124] In some examples, the communications manager **620**, the receiver **610**, the transmitter **615**, or various combinations or components thereof may be implemented in hardware (e.g., in communications management circuitry). The hardware may include at least one of a processor, a digital signal processor (DSP), a central processing unit (CPU), an application-specific integrated circuit (ASIC), a field-programmable gate array (FPGA) or other programmable logic device, a microcontroller, discrete gate or transistor logic, discrete hardware components, or any combination thereof configured as or otherwise supporting, individually or collectively, a means for performing the functions described in the present disclosure. In some examples, at least one processor and at least one memory coupled with the at least one processor may be configured to perform one or more of the functions described herein (e.g., by one or more processors, individually or collectively, executing instructions stored in the at least one memory).

[0125] Additionally, or alternatively, the communications manager **620**, the receiver **610**, the transmitter **615**, or various combinations or components thereof may be implemented in code (e.g., as communications management software or firmware) executed by at least one processor. If implemented in code executed by at least one processor, the functions of the communications manager **620**, the receiver **610**, the transmitter **615**, or various combinations or components thereof may be performed by a general-purpose processor, a DSP, a CPU, an ASIC, an FPGA, a microcontroller, or any combination of these or other programmable logic devices (e.g., configured as or otherwise supporting, individually or collectively, a means for performing the functions described in the present disclosure).

[0126] In some examples, the communications manager **620** may be configured to perform various operations (e.g., receiving, obtaining, monitoring, outputting, transmitting) using or otherwise in cooperation with the receiver **610**, the transmitter **615**, or both. For example, the communications manager **620** may receive information from the receiver **610**, send information to the transmitter **615**, or be integrated in combination with the receiver **610**, the transmitter **615**, or both to obtain information, output information, or perform various other operations as described herein.

[0127] The communications manager **620** may support wireless communication in accordance with examples as disclosed herein. For example, the communications manager **620** is capable of, configured to, or operable to support a means for transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The communications manager **620** is capable of, configured to, or operable to support a means for receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The communications manager **620** is capable of, configured to, or operable to support a means for performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0128] By including or configuring the communications manager **620** in accordance with examples as described herein, the device **605** (e.g., at least one processor controlling or otherwise coupled with the receiver **610**, the transmitter **615**, the communications manager **620**, or a combination thereof) may support techniques for reduced processing, reduced complexity in calculations, reduced power consumption, and more efficient utilization of communication resources by performing batches of non-linear correction processes during sub-iterations of a DPoD correction process.

[0129] FIG. **7** shows a block diagram **700** of a device **705** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The device **705** may be an example of aspects of a device **605** or a UE **115** as described herein. The device **705** may include a receiver **710**, a transmitter **715**, and a communications manager **720**. The device **705**, or one or more components of the device **705** (e.g., the receiver **710**, the transmitter **715**, and the communications manager **720**), may include at least one processor, which may be coupled with at least one memory, to support the described techniques. Each of these components may be in communication with one another (e.g., via one or more buses).

[0130] The receiver **710** may provide a means for receiving information such as packets, user data, control information, or any combination thereof associated with various information channels (e.g., control channels, data channels, information channels related to successive DPoD correction). Information may be passed on to other components of the device **705**. The receiver **710** may utilize a single antenna or a set of multiple antennas.

[0131] The transmitter **715** may provide a means for transmitting signals generated by other components of the device **705**. For example, the transmitter **715** may transmit information such as packets, user data, control information, or any combination thereof associated with various information channels (e.g., control channels, data channels, information channels related to successive DPoD correction). In some examples, the transmitter **715** may be co-located with a receiver **710** in a transceiver module. The transmitter **715** may utilize a single antenna or a set of multiple antennas.

[0132] The device **705**, or various components thereof, may be an example of means for performing various aspects of successive DPoD correction as described herein. For example, the communications manager **720** may include a control message component **725**, a scheduling configuration component **730**, an estimation component **735**, or any combination thereof. The communications manager **720** may be an example of aspects of a communications manager **620** as described herein. In some examples, the communications manager **720**, or various components thereof, may be configured to perform various operations (e.g., receiving, obtaining, monitoring, outputting, transmitting) using or otherwise in cooperation with the receiver **710**, the transmitter **715**, or both. For example, the communications manager **720** may receive information from the receiver **710**, send information to the transmitter **715**, or be integrated in combination with the receiver **710**, the transmitter **715**, or both to obtain information, output information, or perform various other operations as described herein.

[0133] The communications manager **720** may support wireless communication in accordance with examples as disclosed herein. The control message component **725** is capable of, configured to, or operable to support a means for transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The scheduling configuration component **730** is capable of, configured to, or operable to support a means for receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The estimation component **735** is capable of, configured to, or operable to support a means for performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0134] FIG. **8** shows a block diagram **800** of a communications manager **820** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The communications manager **820** may be an example of aspects of a communications manager **620**, a communications manager **720**, or both, as described herein. The communications manager **820**, or various components thereof, may be an example of means for performing various aspects of successive DPoD correction as described herein. For example, the communications manager **820** may include a control message component **825**, a scheduling configuration component **830**, an estimation component **835**, a capability component **840**, a signal component **845**, a symbol correction component **850**, or any combination thereof. Each of these components, or components or subcomponents thereof (e.g., one or more processors, one or more memories), may communicate, directly or indirectly, with one another (e.g., via one or more buses).

[0135] The communications manager **820** may support wireless communication in accordance with examples as disclosed herein. The control message component **825** is capable of, configured to, or operable to support a means for transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The scheduling configuration component **830** is capable of, configured to, or operable to support a means for receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The estimation component **835** is capable of, configured to, or operable to support a means for performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0136] In some examples, the capability component **840** is capable of, configured to, or operable to support a means for transmitting a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, where the quantity of parallel processes supported at the UE is based on the capability of the UE.

[0137] In some examples, the signal component **845** is capable of, configured to, or operable to support a means for receiving a first signal including one or more first symbols, where performing the respective subsets of the set of non-linear estimation processes is based on estimating one or more second symbols of a second signal transmitted by a network entity and corresponding to the one or more first symbols of the first signal.

[0138] In some examples, the symbol correction component **850** is capable of, configured to, or operable to support a means for at least partially correcting, during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, an amplitude and phase of a first symbol of the one or more first symbols based on performing a respective subset of the set of non-linear estimation processes.

[0139] In some examples, the estimation component **835** is capable of, configured to, or operable to support a means for performing respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations, where each non-linear estimation process of a first subset of the second set of non-linear estimation processes is based on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes, where the first subset is performed during a first sub-iteration of the quantity of sub-iterations and the second subset is performed during a second sub-iteration before the first sub-iteration.

[0140] In some examples, the estimation component **835** is capable of, configured to, or operable to support a means for performing respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process, where each linear estimation process of the third set of linear estimation processes is associated with estimating a respective scalar coefficient value.

[0141] In some examples, the quantity of parallel processes supported at the UE is based on a threshold latency value, a threshold power value, a threshold complexity value, or any combination thereof. In some examples, the schedule is based on one or more parameters associated with one or more transmission lanes of a network entity. In some examples, the schedule is based on the quantity of parallel processes supported at the UE. In some examples, the set of non-linear estimation processes includes one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

[0142] FIG. **9** shows a diagram of a system **900** including a device **905** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The device **905** may be an example of or include the components of a device **605**, a device **705**, or a UE **115** as described herein. The device **905** may communicate (e.g., wirelessly) with one or more network entities **105**, one or more UEs **115**, or any combination thereof. The device **905** may include components for bi-directional voice and data communications including components for transmitting and receiving communications, such as a communications manager **920**, an input/output (I/O) controller **910**, a transceiver **915**, an antenna **925**, at least one memory **930**, code **935**, and at least one processor **940**. These components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more buses (e.g., a bus **945**).

[0143] The I/O controller **910** may manage input and output signals for the device **905**. The I/O controller **910** may also manage peripherals not integrated into the device **905**. In some cases, the I/O controller **910** may represent a physical connection or port to an external peripheral. In some cases, the I/O controller **910** may utilize an operating system such as iOS®, ANDROID®, MS-DOS®, MS-WINDOWS®, OS/2®, UNIX®, LINUX®, or another known operating system. Additionally, or alternatively, the I/O controller **910** may represent or interact with a modem, a keyboard, a mouse, a touchscreen, or a similar device. In some cases, the I/O controller **910** may be implemented as part of one or more processors, such as the at least one processor **940**. In some cases, a user may interact with the device **905** via the I/O controller **910** or via hardware components controlled by the I/O controller **910**.

[0144] In some cases, the device **905** may include a single antenna **925**. However, in some other cases, the device **905** may have more than one antenna **925**, which may be capable of concurrently transmitting or receiving multiple wireless transmissions. The transceiver **915** may communicate bi-directionally, via the one or more antennas **925**, wired, or wireless links as described herein. For example, the transceiver **915** may represent a wireless transceiver and may communicate bi-directionally with another wireless transceiver. The transceiver **915** may also include a modem to modulate the packets, to provide the modulated packets to one or more antennas **925** for transmission, and to demodulate packets received from the one or more antennas **925**. The transceiver **915**, or the transceiver **915** and one or more antennas **925**, may be an example of a transmitter **615**, a transmitter **715**, a receiver **610**, a receiver **710**, or any combination thereof or component thereof, as described herein.

[0145] The at least one memory **930** may include random access memory (RAM) and read-only memory (ROM). The at least one memory **930** may store computer-readable, computer-executable code **935** including instructions that, when executed by the at least one processor **940**, cause the device **905** to perform various functions described herein. The code **935** may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. In some cases, the code **935** may not be directly executable by the at least one processor **940** but may cause a computer (e.g., when compiled and executed) to perform functions described herein. In some cases, the at least one memory **930** may contain, among other things, a basic I/O system (BIOS) which may control basic hardware or software operation such as the interaction with peripheral components or devices.

[0146] The at least one processor **940** may include an intelligent hardware device (e.g., a general-purpose processor, a DSP, a CPU, a microcontroller, an ASIC, an FPGA, a programmable logic device, a discrete gate or transistor logic component, a discrete hardware component, or any combination thereof). In some cases, the at least one processor **940** may be configured to operate a memory array using a memory controller. In some other cases, a memory controller may be integrated into the at least one processor **940**. The at least one processor **940** may be configured to execute computer-readable instructions stored in a memory (e.g., the at least one memory **930**) to cause the device **905** to perform various functions (e.g., functions or tasks supporting successive DPoD correction). For example, the device **905** or a component of the device **905** may include at least one processor **940** and at least one memory **930** coupled with or to the at least one processor **940**, the at least one processor **940** and at least one memory **930** configured to perform various functions described herein. In some examples, the at least one processor **940** may include multiple processors and the at least one memory **930** may include multiple memories. One or more of the multiple processors may be coupled with one or more of the multiple memories, which may, individually or collectively, be configured to perform various functions herein. In some examples, the at least one processor **940** may be a component of a processing system, which may refer to a system (such as a series) of machines, circuitry (including, for example, one or both of processor circuitry (which may include the at least one processor **940**) and memory circuitry (which may include the at least one memory **930**)), or components, that receives or obtains inputs and processes the inputs to produce, generate, or obtain a set of outputs. The processing system may be configured to perform one or more of the functions described herein. For example, the at least one processor **940** or a processing system including the at least one processor **940** may be configured to, configurable to, or operable to cause the device **905** to perform one or more of the functions described herein. Further, as described herein, being "configured to," being "configurable to," and being "operable to" may be used interchangeably and may be associated with a capability, when executing code stored in the at least one memory **930** or otherwise, to perform one or more of the functions described herein.

[0147] The communications manager **920** may support wireless communication in accordance with examples as disclosed herein. For example, the communications manager **920** is capable of, configured to, or operable to support a means for transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The communications manager **920** is capable of, configured to, or operable to support a means for receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The communications manager **920** is capable of, configured to, or operable to support a means for performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0148] By including or configuring the communications manager **920** in accordance with examples as described herein, the device **905** may support techniques for reduced latency, reduced power consumption, more efficient utilization of communication resources, improved performance in signaling and decoding, and improved utilization of processing capability including reduction in complexity of calculations by performing batches of non-linear correction processes during sub-iterations of a DPoD correction process.

[0149] In some examples, the communications manager **920** may be configured to perform various operations (e.g., receiving, monitoring, transmitting) using or otherwise in cooperation with the transceiver **915**, the one or more antennas **925**, or any combination thereof. Although the communications manager **920** is illustrated as a separate component, in some examples, one or more functions described with reference to the communications manager **920** may be supported by or performed by the at least one processor **940**, the at least one memory **930**, the code **935**, or any combination thereof. For example, the code **935** may include instructions executable by the at least one processor **940** to cause the device **905** to perform various aspects of successive DPoD correction as described herein, or the at least one processor **940** and the at least one memory **930** may be otherwise configured to, individually or collectively, perform or support such operations.

[0150] FIG. **10** shows a block diagram **1000** of a device **1005** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The device **1005** may be an example of aspects of a network entity **105** as described herein. The device **1005** may include a receiver **1010**, a transmitter **1015**, and a communications manager **1020**. The device **1005**, or one or more components of the device **1005** (e.g., the receiver **1010**, the transmitter **1015**, and the communications manager **1020**), may include at least one processor, which may be coupled with at least one memory, to, individually or collectively, support or enable the described techniques. Each of these components may be in communication with one another (e.g., via one or more buses).

[0151] The receiver **1010** may provide a means for obtaining (e.g., receiving, determining, identifying) information such as user data, control information, or any combination thereof (e.g., I/Q samples, symbols, packets, protocol data units, service data units) associated with various channels (e.g., control channels, data channels, information channels, channels associated with a protocol stack). Information may be passed on to other components of the device **1005**. In some examples, the receiver **1010** may support obtaining information by receiving signals via one or more antennas. Additionally, or alternatively, the receiver **1010** may support obtaining information by receiving signals via one or more wired (e.g., electrical, fiber optic) interfaces, wireless interfaces, or any combination thereof.

[0152] The transmitter **1015** may provide a means for outputting (e.g., transmitting, providing, conveying, sending) information generated by other components of the device **1005**. For example, the transmitter **1015** may output information such as user data, control information, or any combination thereof (e.g., I/Q samples, symbols, packets, protocol data units, service data units) associated with various channels (e.g., control channels, data channels, information channels, channels associated with a protocol stack). In some examples, the transmitter **1015** may support outputting information by transmitting signals via one or more antennas. Additionally, or alternatively, the transmitter **1015** may support outputting information by transmitting signals via one or more wired (e.g., electrical, fiber optic) interfaces, wireless interfaces, or any combination thereof. In some examples, the transmitter **1015** and the receiver **1010** may be co-located in a transceiver, which may include or be coupled with a modem.

[0153] The communications manager **1020**, the receiver **1010**, the transmitter **1015**, or various combinations thereof or various components thereof may be examples of means for performing various aspects of successive DPoD correction as described herein. For example, the communications manager **1020**, the receiver **1010**, the transmitter **1015**, or various combinations or components thereof may be capable of performing one or more of the functions described herein.

[0154] In some examples, the communications manager **1020**, the receiver **1010**, the transmitter **1015**, or various combinations or components thereof may be implemented in hardware (e.g., in communications management circuitry). The hardware may include at least one of a processor, a DSP, a CPU, an ASIC, an FPGA or other programmable logic device, a microcontroller, discrete gate or transistor logic, discrete hardware components, or any combination thereof configured as or otherwise supporting, individually or collectively, a means for performing the functions described in the present disclosure. In some examples, at least one processor and at least one memory coupled with the at least one processor may be configured to perform one or more of the functions described herein (e.g., by one or more processors, individually or collectively, executing instructions stored in the at least one memory).

[0155] Additionally, or alternatively, the communications manager **1020**, the receiver **1010**, the transmitter **1015**, or various combinations or components thereof may be implemented in code (e.g., as communications management software or firmware) executed by at least one processor. If implemented in code executed by at least one processor, the functions of the communications manager **1020**, the receiver **1010**, the transmitter **1015**, or various combinations or components thereof may be performed by a general-purpose processor, a DSP, a CPU, an ASIC, an FPGA, a microcontroller, or any combination of these or other programmable logic devices (e.g., configured as or otherwise supporting, individually or collectively, a means for performing the functions described in the present disclosure).

[0156] In some examples, the communications manager **1020** may be configured to perform various operations (e.g., receiving, obtaining, monitoring, outputting, transmitting) using or otherwise in cooperation with the receiver **1010**, the transmitter **1015**, or both. For example, the communications manager **1020** may receive information from the receiver **1010**, send information to the transmitter **1015**, or be integrated in combination with the receiver **1010**, the transmitter **1015**, or both to obtain information, output information, or perform various other operations as described herein.

[0157] The communications manager **1020** may support wireless communication in accordance with examples as disclosed herein. For example, the communications manager **1020** is capable of, configured to, or operable to support a means for obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The communications manager **1020** is capable of, configured to, or operable to support a means for outputting, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0158] By including or configuring the communications manager **1020** in accordance with examples as described herein, the device **1005** (e.g., at least one processor controlling or otherwise coupled with the receiver **1010**, the transmitter **1015**, the communications manager **1020**, or a combination thereof) may support techniques for reduced processing, reduced complexity in calculations, reduced power consumption, and more efficient utilization of communication resources by performing batches of non-linear correction processes during sub-iterations of a DPoD correction process.

[0159] FIG. **11** shows a block diagram **1100** of a device **1105** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The device **1105** may be an example of aspects of a device **1005** or a network entity **105** as described herein. The device **1105** may include a receiver **1110**, a transmitter **1115**, and a communications manager **1120**. The device **1105**, or one or more components of the device **1105** (e.g., the receiver **1110**, the transmitter **1115**, and the communications manager **1120**), may include at least one processor, which may be coupled with at least one memory, to support the described techniques. Each of these components may be in communication with one another (e.g., via one or more buses).

[0160] The receiver **1110** may provide a means for obtaining (e.g., receiving, determining, identifying) information such as user data, control information, or any combination thereof (e.g., I/Q samples, symbols, packets, protocol data units, service data units) associated with various channels (e.g., control channels, data channels, information channels, channels associated with a protocol stack). Information may be passed on to other components of the device **1105**. In some examples, the receiver **1110** may support obtaining information by receiving signals via one or more antennas. Additionally, or alternatively, the receiver **1110** may support obtaining information by receiving signals via one or more wired (e.g., electrical, fiber optic) interfaces, wireless interfaces, or any combination thereof.

[0161] The transmitter **1115** may provide a means for outputting (e.g., transmitting, providing, conveying, sending) information generated by other components of the device **1105**. For example, the transmitter **1115** may output information such as user data, control information, or any combination thereof (e.g., I/Q samples, symbols, packets, protocol data units, service data units) associated with various channels (e.g., control channels, data channels, information channels, channels associated with a protocol stack). In some examples, the transmitter **1115** may support outputting information by transmitting signals via one or more antennas. Additionally, or alternatively, the transmitter **1115** may support outputting information by transmitting signals via one or more wired (e.g., electrical, fiber optic) interfaces, wireless interfaces, or any combination thereof. In some examples, the transmitter **1115** and the receiver **1110** may be co-located in a transceiver, which may include or be coupled with a modem.

[0162] The device **1105**, or various components thereof, may be an example of means for performing various aspects of successive DPoD correction as described herein. For example, the communications manager **1120** may include a control message component **1125** a scheduling configuration component **1130**, or any combination thereof. The communications manager **1120** may be an example of aspects of a communications manager **1020** as described herein. In some examples, the communications manager **1120**, or various components thereof, may be configured to perform various operations (e.g., receiving, obtaining, monitoring, outputting, transmitting) using or otherwise in cooperation with the receiver **1110**, the transmitter **1115**, or both. For example, the communications manager **1120** may receive information from the receiver **1110**, send information to the transmitter **1115**, or be integrated in combination with the receiver **1110**, the transmitter **1115**, or both to obtain information, output information, or perform various other operations as described herein.

[0163] The communications manager **1120** may support wireless communication in accordance with examples as disclosed herein. The control message component **1125** is capable of, configured to, or operable to support a means for obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The scheduling configuration component **1130** is capable of, configured to, or operable to support a means for outputting, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0164] FIG. **12** shows a block diagram **1200** of a communications manager **1220** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The communications manager **1220** may be an example of aspects of a communications manager **1020**, a communications manager **1120**, or both, as described herein. The communications manager **1220**, or various components thereof, may be an example of means for performing various aspects of successive DPoD correction as described herein. For example, the communications manager **1220** may include a control message component **1225**, a scheduling configuration component **1230**, a capability component **1235**, a signal component **1240**, or any combination thereof. Each of these components, or components or subcomponents thereof (e.g., one or more processors, one or more memories), may communicate, directly or indirectly, with one another (e.g., via one or more buses) which may include communications within a protocol layer of a protocol stack, communications associated with a logical channel of a protocol stack (e.g., between protocol layers of a protocol stack, within a device, component, or virtualized component associated with a network entity **105**, between devices, components, or virtualized components associated with a network entity **105**), or any combination thereof.

[0165] The communications manager **1220** may support wireless communication in accordance with examples as disclosed herein. The control message component **1225** is capable of, configured to, or operable to support a means for obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The scheduling configuration component **1230** is capable of, configured to, or operable to support a means for outputting, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0166] In some examples, the capability component **1235** is capable of, configured to, or operable to support a means for obtaining a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, where the quantity of parallel processes supported at the UE is based on the capability of the UE.

[0167] In some examples, the signal component **1240** is capable of, configured to, or operable to support a means for outputting a first signal including one or more symbols, the first signal associated with the quantity of parallel processes and the quantity of sub-iterations of the successive non-linear distortion correction process.

[0168] In some examples, the schedule is based on one or more parameters associated with one or more transmission lanes of the network entity. In some examples, the schedule is based on the quantity of parallel processes supported at the UE. In some examples, the set of non-linear estimation processes includes one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

[0169] FIG. **13** shows a diagram of a system **1300** including a device **1305** that supports successive DPoD correction in accordance with one or more aspects of the present disclosure. The device **1305** may be an example of or include the components of a device **1005**, a device **1105**, or a network entity **105** as described herein. The device **1305** may communicate with one or more network entities **105**, one or more UEs **115**, or any combination thereof, which may include communications over one or more wired interfaces, over one or more wireless interfaces, or any combination thereof. The device **1305** may include components that support outputting and obtaining communications, such as a communications manager **1320**, a transceiver **1310**, an antenna **1315**, at least one memory **1325**, code **1330**, and at least one processor **1335**. These components may be in electronic communication or otherwise coupled (e.g., operatively, communicatively, functionally, electronically, electrically) via one or more buses (e.g., a bus **1340**).

[0170] The transceiver **1310** may support bi-directional communications via wired links, wireless links, or both as described herein. In some examples, the transceiver **1310** may include a wired transceiver and may communicate bi-directionally with another wired transceiver. Additionally, or alternatively, in some examples, the transceiver **1310** may include a wireless transceiver and may communicate bi-directionally with another wireless transceiver. In some examples, the device **1305** may include one or more antennas **1315**, which may be capable of transmitting or receiving wireless transmissions (e.g., concurrently). The transceiver **1310** may also include a modem to modulate signals, to provide the modulated signals for transmission (e.g., by one or more antennas **1315**, by a wired transmitter), to receive modulated signals (e.g., from one or more antennas **1315**, from a wired receiver), and to demodulate signals. In some implementations, the transceiver **1310** may include one or more interfaces, such as one or more interfaces coupled with the one or more antennas **1315** that are configured to support various receiving or obtaining operations, or one or more interfaces coupled with the one or more antennas **1315** that are configured to support various transmitting or outputting operations, or a combination thereof. In some implementations, the transceiver **1310** may include or be configured for coupling with one or more processors or one or more memory components that are operable to perform or support operations based on received or obtained information or signals, or to generate information or other signals for transmission or other outputting, or any combination thereof. In some implementations, the transceiver **1310**, or the transceiver **1310** and the one or more antennas **1315**, or the transceiver **1310** and the one or more antennas **1315** and one or more processors or one or more memory components (e.g., the at least one processor **1335**, the at least one memory **1325**, or both), may be included in a chip or chip assembly that is installed in the device **1305**. In some examples, the transceiver **1310** may be operable to support communications via one or more communications links (e.g., a communication link **125**, a backhaul communication link **120**, a midhaul communication link **162**, a fronthaul communication link **168**).

[0171] The at least one memory **1325** may include RAM, ROM, or any combination thereof. The at least one memory **1325** may store computer-readable, computer-executable code **1330** including instructions that, when executed by one or more of the at least one processor **1335**, cause the device **1305** to perform various functions described herein. The code **1330** may be stored in a non-transitory computer-readable medium such as system memory or another type of memory. In some cases, the code **1330** may not be directly executable by a processor of the at least one processor **1335** but may cause a computer (e.g., when compiled and executed) to perform functions described herein. In some cases, the at least one memory **1325** may contain, among other things, a BIOS which may control basic hardware or software operation such as the interaction with peripheral components or devices. In some examples, the at least one processor **1335** may include multiple processors and the at least one memory **1325** may include multiple memories. One or more of the multiple processors may be coupled with one or more of the multiple memories which may, individually or collectively, be configured to perform various functions herein (for example, as part of a processing system).

[0172] The at least one processor **1335** may include an intelligent hardware device (e.g., a general-purpose processor, a DSP, an ASIC, a CPU, an FPGA, a microcontroller, a programmable logic device, discrete gate or transistor logic, a discrete hardware component, or any combination thereof). In some cases, the at least one processor **1335** may be configured to operate a memory array using a memory controller. In some other cases, a memory controller may be integrated into one or more of the at least one processor **1335**. The at least one processor **1335** may be configured to execute computer-readable instructions stored in a memory (e.g., one or more of the at least one memory **1325**) to cause the device **1305** to perform various functions (e.g., functions or tasks supporting successive DPoD correction). For example, the device **1305** or a component of the device **1305** may include at least one processor **1335** and at least one memory **1325** coupled with one or more of the at least one processor **1335**, the at least one processor **1335** and the at least one memory **1325** configured to perform various functions described herein. The at least one processor **1335** may be an example of a cloud-computing platform (e.g., one or more physical nodes and supporting software such as operating systems, virtual machines, or container instances) that may host the functions (e.g., by executing code **1330**) to perform the functions of the device **1305**. The at least one processor **1335** may be any one or more suitable processors capable of executing scripts or instructions of one or more software programs stored in the device **1305** (such as within one or more of the at least one memory **1325**). In some examples, the at least one processor **1335** may include multiple processors and the at least one memory **1325** may include multiple memories. One or more of the multiple processors may be coupled with one or more of the multiple memories, which may, individually or collectively, be configured to perform various functions herein. In some examples, the at least one processor **1335** may be a component of a processing system, which may refer to a system (such as a series) of machines, circuitry (including, for example, one or both of processor circuitry (which may include the at least one processor **1335**) and memory circuitry (which may include the at least one memory **1325**)), or components, that receives or obtains inputs and processes the inputs to produce, generate, or obtain a set of outputs. The processing system may be configured to perform one or more of the functions described herein. For example, the at least one processor **1335** or a processing system including the at least one processor **1335** may be configured to, configurable to, or operable to cause the device **1305** to perform one or more of the functions described herein. Further, as described herein, being "configured to," being "configurable to," and being "operable to" may be used interchangeably and may be associated with a capability, when executing code stored in the at least one memory **1325** or otherwise, to perform one or more of the functions described herein.

[0173] In some examples, a bus **1340** may support communications of (e.g., within) a protocol layer of a protocol stack. In some examples, a bus **1340** may support communications associated with a logical channel of a protocol stack (e.g., between protocol layers of a protocol stack), which may include communications performed within a component of the device **1305**, or between different components of the device **1305** that may be co-located or located in different locations (e.g., where the device **1305** may refer to a system in which one or more of the communications manager **1320**, the transceiver **1310**, the at least one memory **1325**, the code **1330**, and the at least one processor **1335** may be located in one of the different components or divided between different components).

[0174] In some examples, the communications manager **1320** may manage aspects of communications with a core network **130** (e.g., via one or more wired or wireless backhaul links). For example, the communications manager **1320** may manage the transfer of data communications for client devices, such as one or more UEs **115**. In some examples, the communications manager **1320** may manage communications with other network entities **105**, and may include a controller or scheduler for controlling communications with UEs **115** in cooperation with other network entities **105**. In some examples, the communications manager **1320** may support an X2 interface within an LTE/LTE-A wireless communications network technology to provide communication between network entities **105**.

[0175] The communications manager **1320** may support wireless communication in accordance with examples as disclosed herein. For example, the communications manager **1320** is capable of, configured to, or operable to support a means for obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The communications manager **1320** is capable of, configured to, or operable to support a means for outputting, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0176] By including or configuring the communications manager **1320** in accordance with examples as described herein, the device **1305** may support techniques for reduced latency, reduced power consumption, more efficient utilization of communication resources, improved performance in signaling and decoding, and improved utilization of processing capability including reduction in complexity of calculations by performing batches of non-linear correction processes during sub-iterations of a DPoD correction process.

[0177] In some examples, the communications manager **1320** may be configured to perform various operations (e.g., receiving, obtaining, monitoring, outputting, transmitting) using or otherwise in cooperation with the transceiver **1310**, the one or more antennas **1315** (e.g., where applicable), or any combination thereof. Although the communications manager **1320** is illustrated as a separate component, in some examples, one or more functions described with reference to the communications manager **1320** may be supported by or performed by the transceiver **1310**, one or more of the at least one processor **1335**, one or more of the at least one memory **1325**, the code **1330**, or any combination thereof (for example, by a processing system including at least a portion of the at least one processor **1335**, the at least one memory **1325**, the code **1330**, or any combination thereof). For example, the code **1330** may include instructions executable by one or more of the at least one processor **1335** to cause the device **1305** to perform various aspects of successive DPoD correction as described herein, or the at least one processor **1335** and the at least one memory **1325** may be otherwise configured to, individually or collectively, perform or support such operations.

[0178] FIG. **14** shows a flowchart illustrating a method **1400** that supports successive DPoD correction in accordance with aspects of the present disclosure. The operations of the method **1400** may be implemented by a UE or its components as described herein. For example, the operations of the method **1400** may be performed by a UE **115** as described with reference to FIGS. **1** through **9**. In some examples, a UE may execute a set of instructions to control the functional elements of the UE to perform the described functions. Additionally, or alternatively, the UE may perform aspects of the described functions using special-purpose hardware.

[0179] At **1405**, the method may include transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The operations of block **1405** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1405** may be performed by a control message component **825** as described with reference to FIG. **8**.

[0180] At **1410**, the method may include receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The operations of block **1410** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1410** may be performed by a scheduling configuration component **830** as described with reference to FIG. **8**.

[0181] At **1415**, the method may include performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process. The operations of block **1415** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1415** may be performed by an estimation component **835** as described with reference to FIG. **8**.

[0182] FIG. **15** shows a flowchart illustrating a method **1500** that supports successive DPoD correction in accordance with aspects of the present disclosure. The operations of the method **1500** may be implemented by a UE or its components as described herein. For example, the operations of the method **1500** may be performed by a UE **115** as described with reference to FIGS. **1** through **9**. In some examples, a UE may execute a set of instructions to control the functional elements of the UE to perform the described functions. Additionally, or alternatively, the UE may perform aspects of the described functions using special-purpose hardware.

[0183] At **1505**, the method may include transmitting a capability message indicating a capability of the UE associated with performing a successive non-linear distortion correction process. The operations of block **1505** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1505** may be performed by a capability component **840** as described with reference to FIG. **8**.

[0184] At **1510**, the method may include transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of the successive non-linear distortion correction process, where the quantity of parallel processes supported at the UE is based on the capability of the UE. The operations of block **1510** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1510** may be performed by a control message component **825** as described with reference to FIG. **8**.

[0185] At **1515**, the method may include receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The operations of block **1515** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1515** may be performed by a scheduling configuration component **830** as described with reference to FIG. **8**.

[0186] At **1520**, the method may include performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process. The operations of block **1520** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1520** may be performed by an estimation component **835** as described with reference to FIG. **8**.

[0187] FIG. **16** shows a flowchart illustrating a method **1600** that supports successive DPoD correction in accordance with aspects of the present disclosure. The operations of the method **1600** may be implemented by a UE or its components as described herein. For example, the operations of the method **1600** may be performed by a UE **115** as described with reference to FIGS. **1** through **9**. In some examples, a UE may execute a set of instructions to control the functional elements of the UE to perform the described functions. Additionally, or alternatively, the UE may perform aspects of the described functions using special-purpose hardware.

[0188] At **1605**, the method may include transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The operations of block **1605** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1605** may be performed by a control message component **825** as described with reference to FIG. **8**.

[0189] At **1610**, the method may include receiving, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The operations of block **1610** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1610** may be performed by a scheduling configuration component **830** as described with reference to FIG. **8**.

[0190] At **1615**, the method may include performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process. The operations of block **1615** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1615** may be performed by an estimation component **835** as described with reference to FIG. **8**.

[0191] At **1620**, the method may include performing respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations, where each non-linear estimation process of a first subset of the second set of non-linear estimation processes is based on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes, where the first subset is performed during a first sub-iteration of the quantity of sub-iterations and the second subset is performed during a second sub-iteration before the first sub-iteration. The operations of block **1620** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1620** may be performed by an estimation component **835** as described with reference to FIG. **8**.

[0192] At **1625**, the method may include performing respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process, where each linear estimation process of the third set of linear estimation processes is associated with estimating a respective scalar coefficient value. The operations of block **1625** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1625** may be performed by an estimation component **835** as described with reference to FIG. **8**.

[0193] FIG. **17** shows a flowchart illustrating a method **1700** that supports successive DPoD correction in accordance with aspects of the present disclosure. The operations of the method **1700** may be implemented by a network entity or its components as described herein. For example, the operations of the method **1700** may be performed by a network entity as described with reference to FIGS. **1** through **5** and **10** through **13**. In some examples, a network entity may execute a set of instructions to control the functional elements of the network entity to perform the described functions. Additionally, or alternatively, the network entity may perform aspects of the described functions using special-purpose hardware.

[0194] At **1705**, the method may include obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process. The operations of block **1705** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1705** may be performed by a control message component **1225** as described with reference to FIG. **12**.

[0195] At **1710**, the method may include outputting, based on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process. The operations of block **1710** may be performed in accordance with examples as disclosed herein. In some examples, aspects of the operations of **1710** may be performed by a scheduling configuration component **1230** as described with reference to FIG. **12**.

[0196] The following provides an overview of aspects of the present disclosure:

[0197] Aspect 1: A method for wireless communication by a UE, comprising: transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process; receiving, based at least in part on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process; and performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

[0198] Aspect 2: The method of aspect 1, further comprising: transmitting a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, wherein the quantity of parallel processes supported at the UE is based at least in part on the capability of the UE.

[0199] Aspect 3: The method of any of aspects 1 through 2, further comprising: receiving a first signal comprising one or more first symbols, wherein performing the respective subsets of the set of non-linear estimation processes is based at least in part on estimating one or more second symbols of a second signal transmitted by a network entity and corresponding to the one or more first symbols of the first signal.

[0200] Aspect 4: The method of aspect 3, further comprising: at least partially correcting, during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, an amplitude and phase of a first symbol of the one or more first symbols based at least in part on performing a respective subset of the set of non-linear estimation processes.

[0201] Aspect 5: The method of any of aspects 1 through 4, further comprising: performing respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations, wherein each non-linear estimation process of a first subset of the second set of non-linear estimation processes is based at least in part on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes, wherein the first subset is performed during a first sub-iteration of the quantity of sub-iterations and the second subset is performed during a second sub-iteration before the first sub-iteration.

[0202] Aspect 6: The method of any of aspects 1 through 5, further comprising: performing respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process, wherein each linear estimation process of the third set of linear estimation processes is associated with estimating a respective scalar coefficient value.

[0203] Aspect 7: The method of any of aspects 1 through 6, wherein the quantity of parallel processes supported at the UE is based at least in part on a threshold latency value, a threshold power value, a threshold complexity value, or any combination thereof.

[0204] Aspect 8: The method of any of aspects 1 through 7, wherein the schedule is based at least in part on one or more parameters associated with one or more transmission lanes of a network entity.

[0205] Aspect 9: The method of any of aspects 1 through 8, wherein the schedule is based at least in part on the quantity of parallel processes supported at the UE.

[0206] Aspect 10: The method of any of aspects 1 through 9, wherein the set of non-linear estimation processes comprises one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

[0207] Aspect 11: A method for wireless communication by a network entity, comprising: obtaining a control message indicating a quantity of parallel processes supported at a UE, the quantity of parallel processes associated with each of a quantity of sub iterations of a successive non-linear distortion correction process; and outputting, based at least in part on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

[0208] Aspect 12: The method of aspect 11, further comprising: obtaining a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, wherein the quantity of parallel processes supported at the UE is based at least in part on the capability of the UE.

[0209] Aspect 13: The method of any of aspects 11 through 12, further comprising: outputting a first signal comprising one or more symbols, the first signal associated with the quantity of parallel processes and the quantity of sub iterations of the successive non-linear distortion correction process.

[0210] Aspect 14: The method of any of aspects 11 through 13, wherein the schedule is based at least in part on one or more parameters associated with one or more transmission lanes of the network entity.

[0211] Aspect 15: The method of any of aspects 11 through 14, wherein the schedule is based at least in part on the quantity of parallel processes supported at the UE.

[0212] Aspect 16: The method of any of aspects 11 through 15, wherein the set of non-linear estimation processes comprises one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

[0213] Aspect 17: A UE for wireless communication, comprising one or more memories storing processor-executable code, and one or more processors coupled with the one or more memories and individually or collectively operable to execute the code to cause the UE to perform a method of any of aspects 1 through 10.

[0214] Aspect 18: A UE for wireless communication, comprising at least one means for performing a method of any of aspects 1 through 10.

[0215] Aspect 19: A non-transitory computer-readable medium storing code for wireless communication, the code comprising instructions executable by one or more processors to perform a method of any of aspects 1 through 10.

[0216] Aspect 20: A network entity for wireless communication, comprising one or more memories storing processor-executable code, and one or more processors coupled with the one or more memories and individually or collectively operable to execute the code to cause the network entity to perform a method of any of aspects 11 through 16.

[0217] Aspect 21: A network entity for wireless communication, comprising at least one means for performing a method of any of aspects 11 through 16.

[0218] Aspect 22: A non-transitory computer-readable medium storing code for wireless communication, the code comprising instructions executable by one or more processors to perform a method of any of aspects 11 through 16.

[0219] It should be noted that the methods described herein describe possible implementations, and that the operations and the steps may be rearranged or otherwise modified and that other implementations are possible. Further, aspects from two or more of the methods may be combined.

[0220] Although aspects of an LTE, LTE-A, LTE-A Pro, or NR system may be described for purposes of example, and LTE, LTE-A, LTE-A Pro, or NR terminology may be used in much of the description, the techniques described herein are applicable beyond LTE, LTE-A, LTE-A Pro, or NR networks. For example, the described techniques may be applicable to various other wireless communications systems such as Ultra Mobile Broadband (UMB), Institute of Electrical and Electronics Engineers (IEEE) 802.11 (Wi-Fi), IEEE 802.16 (WiMAX), IEEE 802.20, Flash-OFDM, as well as other systems and radio technologies not explicitly mentioned herein.

[0221] Information and signals described herein may be represented using any of a variety of different technologies and techniques. For example, data, instructions, commands, information, signals, bits, symbols, and chips that may be referenced throughout the description may be represented by voltages, currents, electromagnetic waves, magnetic fields or particles, optical fields or particles, or any combination thereof.

[0222] The various illustrative blocks and components described in connection with the disclosure herein may be implemented or performed using a general-purpose processor, a DSP, an ASIC, a CPU, an FPGA or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any combination thereof designed to perform the functions described herein. A general-purpose processor may be a microprocessor but, in the alternative, the processor may be any processor, controller, microcontroller, or state machine. A processor may also be implemented as a combination of computing devices (e.g., a combination of a DSP and a microprocessor, multiple microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration). Any functions or operations described herein as being capable of being performed by a processor may be performed by multiple processors that, individually or collectively, are capable of performing the described functions or operations.

[0223] The functions described herein may be implemented using hardware, software executed by a processor, firmware, or any combination thereof. If implemented using software executed by a processor, the functions may be stored as or transmitted using one or more instructions or code of a computer-readable medium. Other examples and implementations are within the scope of the disclosure and appended claims. For example, due to the nature of software, functions described herein may be implemented using software executed by a processor, hardware, firmware, hardwiring, or combinations of any of these. Features implementing functions may also be physically located at various positions, including being distributed such that portions of functions are implemented at different physical locations.

[0224] Computer-readable media includes both non-transitory computer storage media and communication media including any medium that facilitates transfer of a computer program from one location to another. A non-transitory storage medium may be any available medium that may be accessed by a general-purpose or special-purpose computer. By way of example, and not limitation, non-transitory computer-readable media may include RAM, ROM, electrically erasable programmable ROM (EEPROM), flash memory, compact disk (CD) ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other non-transitory medium that may be used to carry or store desired program code means in the form of instructions or data structures and that may be accessed by a general-purpose or special-purpose computer, or a general-purpose or special-purpose processor. Also, any connection is properly termed a computer-readable medium. For example, if the software is transmitted from a website, server, or other remote source using a coaxial cable, fiber optic cable, twisted pair, digital subscriber line (DSL), or wireless technologies such as infrared, radio, and microwave, then the coaxial cable, fiber optic cable, twisted pair, DSL, or wireless technologies such as infrared, radio, and microwave are included in the definition of computer-readable medium. Disk and disc, as used herein, include CD, laser disc, optical disc, digital versatile disc (DVD), floppy disk and Blu-ray disc. Disks may reproduce data magnetically, and discs may reproduce data optically using lasers. Combinations of the above are also included within the scope of computer-readable media. Any functions or operations described herein as being capable of being performed by a memory may be performed by multiple memories that, individually or collectively, are capable of performing the described functions or operations.

[0225] As used herein, including in the claims, "or" as used in a list of items (e.g., a list of items prefaced by a phrase such as "at least one of" or "one or more of") indicates an inclusive list such that, for example, a list of at least one of A, B, or C means A or B or C or AB or AC or BC or ABC (i.e., A and B and C). Also, as used herein, the phrase "based on" shall not be construed as a reference to a closed set of conditions. For example, an example step that is described as "based on condition A" may be based on both a condition A and a condition B without departing from the scope of the present disclosure. In other words, as used herein, the phrase "based on" shall be construed in the same manner as the phrase "based at least in part on."

[0226] As used herein, including in the claims, the article "a" before a noun is open-ended and understood to refer to "at least one" of those nouns or "one or more" of those nouns. Thus, the terms "a," "at least one," "one or more," "at least one of one or more" may be interchangeable. For example, if a claim recites "a component" that performs one or more functions, each of the individual functions may be performed by a single component or by any combination of multiple components. Thus, the term "a component" having characteristics or performing functions may refer to "at least one of one or more components" having a particular characteristic or performing a particular function. Subsequent reference to a component introduced with the article "a" using the terms "the" or "said" may refer to any or all of the one or more components. For example, a component introduced with the article "a" may be understood to mean "one or more components," and referring to "the component" subsequently in the claims may be understood to be equivalent to referring to "at least one of the one or more components." Similarly, subsequent reference to a component introduced as "one or more components" using the terms "the" or "said" may refer to any or all of the one or more components. For example, referring to "the one or more components" subsequently in the claims may be understood to be equivalent to referring to "at least one of the one or more components."

[0227] The term "determine" or "determining" encompasses a variety of actions and, therefore, "determining" can include calculating, computing, processing, deriving, investigating, looking up (such as via looking up in a table, a database or another data structure), ascertaining and the like. Also, "determining" can include receiving (e.g., receiving information), accessing (e.g., accessing data stored in memory) and the like. Also, "determining" can include resolving, obtaining, selecting, choosing, establishing, and other such similar actions.

[0228] In the appended figures, similar components or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label by a dash and a second label that distinguishes among the similar components. If just the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label, or other subsequent reference label.

[0229] The description set forth herein, in connection with the appended drawings, describes example configurations and does not represent all the examples that may be implemented or that are within the scope of the claims. The term "example" used herein means "serving as an example, instance, or illustration," and not "preferred" or "advantageous over other examples." The detailed description includes specific details for the purpose of providing an understanding of the described techniques. These techniques, however, may be practiced without these specific details. In some instances, known structures and devices are shown in block diagram form in order to avoid obscuring the concepts of the described examples.

[0230] The description herein is provided to enable a person having ordinary skill in the art to make or use the disclosure. Various modifications to the disclosure will be apparent to a person having ordinary skill in the art, and the generic principles defined herein may be applied to other variations without departing from the scope of the disclosure. Thus, the disclosure is not limited to the examples and designs described herein but is to be accorded the broadest scope consistent with the principles and novel features disclosed herein.

What is claimed is:

1. A user equipment (UE), comprising:

one or more memories storing processor-executable code; and

one or more processors coupled with the one or more memories and individually or collectively operable to execute the code to cause the UE to:

transmit a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process;

receive, based at least in part on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process; and

perform, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

2. The UE of claim **1**, wherein the one or more processors are individually or collectively further operable to execute the code to cause the UE to:

transmit a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, wherein the quantity of parallel processes supported at the UE is based at least in part on the capability of the UE.

3. The UE of claim **1**, wherein the one or more processors are individually or collectively further operable to execute the code to cause the UE to:

receive a first signal comprising one or more first symbols, wherein performing the respective subsets of the set of non-linear estimation processes is based at least in part on estimating one or more second symbols of a second signal transmitted by a network entity and corresponding to the one or more first symbols of the first signal.

4. The UE of claim **3**, wherein the one or more processors are individually or collectively further operable to execute the code to cause the UE to:

at least partially correct, during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, an amplitude and phase of a first symbol of the one or more first symbols based at least in part on performing a respective subset of the set of non-linear estimation processes.

5. The UE of claim **1**, wherein the one or more processors are individually or collectively further operable to execute the code to cause the UE to:

perform respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations, wherein each non-linear estimation process of a first subset of the second set of non-linear estimation processes is based at least in part on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes, wherein the first subset is performed during a first sub-iteration of the quantity of sub-iterations and the second subset is performed during a second sub-iteration before the first sub-iteration.

6. The UE of claim **1**, wherein the one or more processors are individually or collectively further operable to execute the code to cause the UE to:

perform respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process, wherein each linear estimation process of the third set of linear estimation processes is associated with estimating a respective scalar coefficient value.

7. The UE of claim **1**, wherein the quantity of parallel processes supported at the UE is based at least in part on a threshold latency value, a threshold power value, a threshold complexity value, or any combination thereof.

8. The UE of claim **1**, wherein the schedule is based at least in part on one or more parameters associated with one or more transmission lanes of a network entity.

9. The UE of claim **1**, wherein the schedule is based at least in part on the quantity of parallel processes supported at the UE.

10. The UE of claim **1**, wherein:

the set of non-linear estimation processes comprises one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

11. A network entity, comprising:

one or more memories storing processor-executable code; and

one or more processors coupled with the one or more memories and individually or collectively operable to execute the code to cause the network entity to:

obtain a control message indicating a quantity of parallel processes supported at a user equipment (UE), the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process; and

output, based at least in part on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

12. The network entity of claim **11**, wherein the one or more processors are individually or collectively further operable to execute the code to cause the network entity to:

obtain a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, wherein the quantity of parallel processes supported at the UE is based at least in part on the capability of the UE.

13. The network entity of claim **11**, wherein the one or more processors are individually or collectively further operable to execute the code to cause the network entity to:

output a first signal comprising one or more symbols, the first signal associated with the quantity of parallel processes and the quantity of sub-iterations of the successive non-linear distortion correction process.

14. The network entity of claim **11**, wherein the schedule is based at least in part on one or more parameters associated with one or more transmission lanes of the network entity.

15. The network entity of claim **11**, wherein the schedule is based at least in part on the quantity of parallel processes supported at the UE.

16. The network entity of claim **11**, wherein:

the set of non-linear estimation processes comprises one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

17. A method for wireless communication by a user equipment (UE), comprising:

transmitting a control message indicating a quantity of parallel processes supported at the UE, the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process;

receiving, based at least in part on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process; and

performing, in accordance with the schedule, the respective subsets of the set of non-linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process.

18. The method of claim **17**, further comprising:

transmitting a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, wherein the quantity of parallel processes supported at the UE is based at least in part on the capability of the UE.

19. The method of claim **17**, further comprising:

receiving a first signal comprising one or more first symbols, wherein performing the respective subsets of the set of non-linear estimation processes is based at least in part on estimating one or more second symbols of a second signal transmitted by a network entity and corresponding to the one or more first symbols of the first signal.

20. The method of claim **19**, further comprising:

at least partially correcting, during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process, an amplitude and phase of a first symbol of the one or more first symbols based at least in part on performing a respective subset of the set of non-linear estimation processes.

21. The method of claim **17**, further comprising:

performing respective subsets of a second set of non-linear estimation processes during the quantity of sub-iterations, wherein each non-linear estimation process of a first subset of the second set of non-linear estimation processes is based at least in part on a respective non-linear estimation process of a second subset of the set of non-linear estimation processes, wherein the first subset is performed during a first sub-iteration of the quantity of sub-iterations and the second subset is performed during a second sub-iteration before the first sub-iteration.

22. The method of claim **17**, further comprising:

performing respective subsets of a third set of linear estimation processes during the quantity of sub-iterations of the successive non-linear distortion correction process, wherein each linear estimation process of the third set of linear estimation processes is associated with estimating a respective scalar coefficient value.

23. The method of claim **17**, wherein the quantity of parallel processes supported at the UE is based at least in part on a threshold latency value, a threshold power value, a threshold complexity value, or any combination thereof.

24. The method of claim **17**, wherein the schedule is based at least in part on one or more parameters associated with one or more transmission lanes of a network entity.

25. The method of claim **17**, wherein the schedule is based at least in part on the quantity of parallel processes supported at the UE.

26. The method of claim **17**, wherein the set of non-linear estimation processes comprises one or more non-linear kernel projection processes, one or more Fourier transform processes, and one or more inverse Fourier transform processes.

27. A method for wireless communication by a network entity, comprising:

obtaining a control message indicating a quantity of parallel processes supported at a user equipment (UE), the quantity of parallel processes associated with each of a quantity of sub-iterations of a successive non-linear distortion correction process; and

outputting, based at least in part on the control message, a scheduling configuration message indicating a schedule for performing respective subsets of a set of non-linear estimation processes during each sub-iteration of the quantity of sub-iterations of the successive non-linear distortion correction process.

28. The method of claim **27**, further comprising:

obtaining a capability message indicating a capability of the UE associated with performing the successive non-linear distortion correction process, wherein the quantity of parallel processes supported at the UE is based at least in part on the capability of the UE.

29. The method of claim **27**, further comprising:

outputting a first signal comprising one or more symbols, the first signal associated with the quantity of parallel processes and the quantity of sub-iterations of the successive non-linear distortion correction process.

30. The method of claim **27**, wherein the schedule is based at least in part on one or more parameters associated with one or more transmission lanes of the network entity, the quantity of parallel processes supported at the UE, or both.

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