

CLAIMS

~~WHAT IS CLAIMED IS:~~

1. A method for wireless communications performed by a first device, comprising:
determining at least one latency associated with a beam switch at the first device; ~~and,~~
wherein the at least one latency is associated with the beam switch from a first antenna array module of the first device to a second antenna array module of the first device, wherein the at least one latency comprises at least one of: (1) a maximum latency of any inter-panel beam switch and intra-beam switch latencies of and between the first antenna array module and the second antenna array module, or (2) a delay for awaking the second antenna array module;
_____signaling a second device to use the at least one latency for the second device to determine when, after the second device sends a beam switch command to the first device, the first device is capable of processing a set of measurement signals;_
_____receiving, from the second device, an indication triggering communication of at least one of the set of measurement signals; and
_____receiving, from the second device, the at least one of the set of measurement signals, wherein the at least one of the set of measurement signals is delayed from the indication for at least the at least one latency.
2. The method of claim 1, where the set of measurement signals comprises channel state information reference signals (CSI-RS).
3. The method of claim 1, wherein the first device includes a user equipment (UE).
4. The method of claim 1, wherein the second device includes a base station (BS).
5. The method of claim 1, wherein the beam switch includes a reception beam switch in downlink receiving signal from the second device.
6. The method of claim 1, wherein the beam switch includes a transmission beam switch in uplink transmitting signal to the second device.

7. The method of claim 1, wherein the first device signals a beam switch latency per type of beam switch, the type of beam switching including at least one of an inter-panel beam switching or an intra-panel beam switching.
8. The method of claim 7, wherein:
each of multiple types of beam switches have a corresponding beam switch latency; and
the first device signals the second device to use a beam switch latency per type.
9. The method of claim 7, wherein:
each of multiple types of beam switches have a corresponding default beam switch latency, which can be overwritten by the first device signaled beam switch latency per type.
10. The method of claim 7, wherein the types of latency comprise:
a downlink control information (DCI) triggered beam switch in downlink.
11. The method of claim 10, wherein the DCI triggered beam switch in downlink includes a sequence of switched transmission beams at the second device, wherein each switched beam is used for transmitting each resource of an aperiodic channel state information reference signal resource set with the transmission beam repetition enabled across resources within the resource set.
12. The method of claim 10, wherein the DCI triggered beam switch in downlink includes a sequence of switched reception beams at the first device, wherein each switched beam is used for receiving each resource of an aperiodic channel state information reference signals resource set with the transmission beam repetition enabled across resources within the resource set.
13. The method of claim 10, wherein the DCI triggered beam switch in downlink includes a sequence of switched transmission beams at the second device, wherein each switched beam is used for transmitting each resource of an aperiodic channel state information reference signals resource set with the transmission beam repetition disabled across resources within the resource

set.

14. The method of claim 10, wherein the DCI triggered beam switch in downlink includes a sequence of switched reception beams at the first device, wherein each switched beam is used for receiving each resource of an aperiodic channel state information reference signals resource set with the transmission beam repetition disabled across resources within the resource set.

15. The method of claim 1, wherein the first device signals a beam switch latency that depends, at least in part, on subcarrier spacing.

16. The method of claim 1, wherein the latency is associated with ~~at the~~ beam switch from the first antenna array module to the second antenna array module when the second module is in a low power mode or a sleep mode, wherein the first antenna array module is a source antenna array module to and the second antenna array module is a target antenna array module when the target module is in a low power mode.

17. The method of claim 16, wherein the at least one latency comprises:

a first latency associated with a beam switch from a beam associated with a source antenna array module of the first device to a beam associated with a target antenna array module of the first device; and

a second latency, less than the first latency, associated with a beam switch from a beam associated with the source antenna array module of the first device to another beam associated with the source antenna array module of the first device.

18. The method of claim 16, further comprising:

determining an updated value for the latency based on a current power mode of the target antenna array module; and

signaling the second device an indication of the updated value for the latency.

19. The method of claim 1, wherein:

the first device receives ~~at the~~ beam switch command signaled via a media access control

(MAC) control element (CE); and

the first device indicates, via an acknowledgment (ACK), whether or not the second device should use the indicated latency to determine when the first device is capable of processing the set of measurement signals.

20. A method for wireless communications performed by a first device, comprising:

receiving, from a second device, signaling indicating at least one latency associated with a beam switch at the second device, wherein the at least one latency is associated with the beam switch from a first antenna array module of the second device to a second antenna array module of the second device, wherein the at least one latency comprises at least one of: (1) a maximum latency of any inter-panel beam switch and intra-beam switch latencies of and between the first antenna array module and the second antenna array module, or (2) a delay for awaking the second antenna array module; and

using the latency to determine when, after the first device sends a beam switch command to the second device, the second device is capable of processing a set of measurement signals, wherein using the latency comprises:

transmitting, to the second device, an indication triggering communication of at least one of the set of measurement signals; and

transmitting, to the second device, the at least one of the set of measurement signals, wherein the at least one of the set of measurement signals is delayed from the indication for at least the at least one latency.

21. The method of claim 20, where the set of measurement signals comprises channel state information reference signals (CSI-RS).

22. The method of claim 20, wherein the first device includes a base station (BS).

23. The method of claim 20, wherein the second device includes a user equipment (UE).

24. The method of claim 20, wherein the beam switch includes reception beam switch in downlink.

25. The method of claim 20, wherein the beam switch includes transmission beam switch in uplink.
26. The method of claim 20, wherein the second device signals a beam switch latency per type of beam switch.
27. The method of claim 26, wherein:
each of multiple types of beam switches have a corresponding beam switch latency; and
the second device feeds back a beam switch latency per type, the type including at least one of an inter-panel beam switching or an intra-panel beam switching.
28. The method of claim 26, wherein:
each of multiple types of beam switches have a corresponding default beam switch latency, which can be overwritten by the second device signaled beam switch latency per type.
29. The method of claim 26, wherein the types of latency comprise:
a downlink control information (DCI) triggered beam switch in downlink.
30. The method of claim 29, wherein the DCI triggered beam switch in downlink includes a sequence of switched transmission beams at the first device, wherein each switched beam is used for transmitting each resource of an aperiodic channel state information reference signals resource set with the transmission beam repetition enabled across resources within the resource set.
31. The method of claim 29, wherein the DCI triggered beam switch in downlink includes a sequence of switched reception beams at the second device, wherein each switched beam is used for receiving each resource of an aperiodic channel state information reference signals resource set with the transmission beam repetition enabled across resources within the resource set.
32. The method of claim 29, wherein the DCI triggered beam switch in downlink includes a

sequence of switched transmission beams at the first device, wherein each switched beam is used for transmitting each resource of an aperiodic channel state information reference signals resource set with the transmission beam repetition disabled across resources within the resource set.

33. The method of claim 29, wherein the DCI triggered beam switch in downlink includes a sequence of switched reception beams at the second device, wherein each switched beam is used for receiving each resource of an aperiodic channel state information reference signals resource set with the transmission beam repetition disabled across resources within the resource set.

34. The method of claim 20, wherein the second device signals a beam switch latency that depends, at least in part, on subcarrier spacing.

35. The method of claim 20, wherein the latency is associated with ~~a~~the beam switch from the first antenna array module of the second device to the second antenna array module of the second device when the target module is in a low power mode or sleep mode, wherein the first antenna array module is a source antenna array module to and the second antenna array module is a target antenna array module when the target module is in a low power mode.

36. The method of claim 35, wherein:

the at least one latency comprises at least a first latency and a second latency shorter than the first latency;

the first device is configured to select the first latency to determine when the second device is capable of processing the set of measurement signals if the beam switch command is to switch from a beam associated with a source antenna array module of the second device to a beam associated with a target module of the second device; and

the first device is configured to select the second latency to determine when the second device is capable of processing the set of measurement signals if the beam switch command is to switch from a beam associated with the source antenna array module of the second device to another beam associated with the source antenna array module of the second device.

37. The method of claim 35, further comprising receiving- signaling from the second device indicating an updated latency based on a current power mode of the target antenna array module of the second device.

38. The method of claim 20, wherein:

a beam switch command is signaled via a media access control (MAC) control element (CE); and

the second device indicates whether or not the second device should use the indicated latency via an acknowledgment (ACK).

39. An apparatus for wireless communications by a first device, comprising:

means for determining at least one latency associated with a beam switch at the first device; ~~and, wherein the at least one latency is associated with the beam switch from a first antenna array module of the first device to a second antenna array module of the first device, wherein the at least one latency comprises at least one of: (1) a maximum latency of any inter-panel beam switch and intra-beam switch latencies of and between the first antenna array module and the second antenna array module, or (2) a delay for awaking the second antenna array module;~~

means for signaling a second device to use the at least one latency for the second device to determine when, after the second device sends a beam switch command to the first device, the first device is capable of processing a set of measurement signals;

means for receiving, from the second device, an indication triggering communication of at least one of the set of measurement signals; and

means for receiving, from the second device, the at least one of the set of measurement signals, wherein the at least one of the set of measurement signals is delayed from the indication for at least the at least one latency.

40. An apparatus for wireless communications by a first device, comprising:

means for receiving, from a second device, signaling indicating ~~at least one~~ latency associated with a beam switch at the second device; wherein the at least one latency is associated with the beam switch from a first antenna array module of the second device to a

second antenna array module of the second device, wherein the at least one latency corresponds to a time between when a beam switch command is received in the first antenna array module and when the second antenna array module becomes awake;

means for using the latency to determine when, after the first device sends a beam switch command to the second device, the second device is capable of processing a set of measurement signals;

means for transmitting, to the second device, an indication triggering communication of at least one of the set of measurement signals; and

means for transmitting, to the second device, the at least one of the set of measurement signals, wherein the at least one of the set of measurement signals is delayed from the indication for at least the at least one latency.