

CLAIMS

1. A method of wireless communication operable at a scheduling entity, comprising:
 - dividing a downlink bandwidth into a plurality of sub-bands;
 - allocating a search space to each of a plurality of subordinate entities, wherein the search space comprises one or more control channel elements (CCEs) each mapped to one or more resource element groups (REGs) that are located in a same one of the plurality of sub-bands; and
 - transmitting one or more downlink control messages to the plurality of subordinate entities utilizing the one or more CCEs.
2. The method of claim 1, wherein the transmitting comprises:
 - transmitting a broadcast reference signal in one or more first sub-bands of the plurality of sub-bands; and
 - transmitting a UE-specific reference signal in one or more second sub-bands of the plurality of sub-bands.
3. The method of claim 1, further comprising:
 - mapping consecutive CCEs of the one or more CCEs to the REGs that are distributed in frequency or consecutive in frequency.
4. The method of claim 1, further comprising:
 - configuring at least two of the plurality of sub-bands to have different sub-band configurations based on channel conditions of the subordinate entities.
5. The method of claim 1, wherein the transmitting comprises:
 - determining a pilot density as a function of the corresponding search space.
6. The method of claim 1, wherein the transmitting comprises:
 - determining a transmission mode as a function of the corresponding search space, wherein the transmission mode comprises at least one of single-layer mode, two-layer two-port space frequency block coding (SFBC) mode, multi-layer multiple-input and multiple-output (MIMO) mode, or multi-user MIMO mode.

7. The method of claim 6, further comprising:
determining a MIMO layer of a subordinate entity operating in the multi-user MIMO mode based on the corresponding search space of the subordinate entity.
8. A method of wireless communication operable at a subordinate entity, comprising:
receiving a sub-band configuration comprising a plurality of sub-bands of a downlink bandwidth,
determining a search space comprising one or more control channel elements (CCEs), wherein each of the CCEs is mapped to one or more resource element groups (REGs) that are located in a same one of the plurality of sub-bands; and
receiving one or more downlink control messages from a scheduling entity utilizing the one or more CCEs.
9. The method of claim 8, wherein the receiving comprises:
receiving a broadcast reference signal in one or more first sub-bands of the sub-bands; and
receiving a UE-specific reference signal in one or more second sub-bands of the sub-bands.
10. The method of claim 8, wherein the receiving comprises:
receiving consecutive CCEs of the one or more CCEs that are mapped to the REGs that are distributed in frequency or consecutive in frequency.
11. The method of claim 8, further comprising:
receiving user data in a Physical Downlink Shared Channel (PDSCH) utilizing one of the sub-bands.
12. The method of claim 8, wherein at least two of the sub-bands are configured to have different configurations, comprising at least one of:
different pilot densities; or
different transmission modes.

13. The method of claim 8, wherein the receiving one or more downlink control messages comprises:

determining a pilot density as a function of the corresponding search space.

14. The method of claim 8, wherein the receiving one or more downlink control messages comprises:

determining a transmission mode as a function of the corresponding search space, wherein the transmission mode comprises at least one of single-layer mode, two-layer two-port space frequency block coding (SFBC) mode, multi-layer multiple-input and multiple-output (MIMO) mode, or multi-user MIMO mode.

15. The method of claim 14, further comprising:

determining a MIMO layer when operating in the multi-user MIMO mode based on the corresponding search space of the subordinate entity.

16. A scheduling entity configured for wireless communication comprising:
a communication interface configured to communicate with a plurality of subordinate entities;

a memory stored with executable code; and

a processor operatively coupled to the communication interface and memory, wherein the processor is configured by the executable code to:

divide a downlink bandwidth into a plurality of sub-bands;

allocate a search space to each of the plurality of subordinate entities, wherein the search space comprises one or more control channel elements (CCEs) each mapped to one or more resource element groups (REGs) that are located in a same one of the plurality of sub-bands; and

transmit one or more downlink control messages, utilizing the communication interface, to the plurality of subordinate entities utilizing the one or more CCEs.

17. The scheduling entity of claim 16, wherein the processor is further configured to:

transmit a broadcast reference signal in one or more first sub-bands of the plurality of sub-bands; and

transmit a UE-specific reference signal in one or more second sub-bands of the plurality of sub-bands.

18. The scheduling entity of claim 16, wherein the processor is further configured to:

map consecutive CCEs of the one or more CCEs to the REGs that are distributed in frequency or consecutive in frequency.

19. The scheduling entity of claim 16, wherein the processor is further configured to:

configure at least two of the plurality of sub-bands to have different sub-band configurations based on channel conditions of the subordinate entities.

20. The scheduling entity of claim 16, wherein the processor is further configured to:

determine a pilot density as a function of the corresponding search space.

21. The scheduling entity of claim 16, wherein the processor is further configured to:

determine a transmission mode as a function of the corresponding search space, wherein the transmission mode comprises at least one of single-layer mode, two-layer two-port space frequency block coding (SFBC) mode, multi-layer multiple-input and multiple-output (MIMO) mode, or multi-user MIMO mode.

22. The scheduling entity of claim 21, wherein the processor is further configured to:

determine a MIMO layer of a subordinate entity operating in the multi-user MIMO mode based on the corresponding search space of the subordinate entity.

23. A subordinate entity configured for wireless communication comprising:
a communication interface configured to communicate with a scheduling entity;

a memory stored with executable code; and
a processor operatively coupled to the communication interface and memory,
wherein the processor is configured by the executable code to:
receive a sub-band configuration comprising a plurality of sub-bands of a
downlink bandwidth,
determine a search space comprising one or more control channel elements
(CCEs), wherein each of the CCEs is mapped to one or more resource element groups
(REGs) that are located in a same one of the plurality of sub-bands; and
receive one or more downlink control messages from the scheduling entity
utilizing the one or more CCEs.

24. The subordinate entity of claim 23, wherein the processor is further
configured to:
receive a broadcast reference signal in one or more first sub-bands of the sub-
bands; and
receive a UE-specific reference signal in one or more second sub-bands of the
sub-bands.

25. The subordinate entity of claim 23, wherein the processor is further
configured to:
receive consecutive CCEs of the one or more CCEs that are mapped to the REGs
that are distributed in frequency or consecutive in frequency.

26. The subordinate entity of claim 23, wherein the processor is further
configured to:
receive user data in a Physical Downlink Shared Channel (PDSCH) utilizing one
of the sub-bands.

27. The subordinate entity of claim 23, wherein at least two of the sub-bands
are configured to have different configurations, comprising at least one of:
different pilot densities; or
different transmission modes.

28. The subordinate entity of claim 23, wherein the processor is further configured to:

determine a pilot density as a function of the corresponding search space.

29. The subordinate entity of claim 23, wherein the processor is further configured to:

determine a transmission mode as a function of the corresponding search space, wherein the transmission mode comprises at least one of single-layer mode, two-layer two-port space frequency block coding (SFBC) mode, multi-layer multiple-input and multiple-output (MIMO) mode, or multi-user MIMO mode.

30. The subordinate entity of claim 29, wherein the processor is further configured to:

determine a MIMO layer when operating in the multi-user MIMO mode based on the corresponding search space of the subordinate entity.