

CLAIMS

1. A method for configuring a control resource set and a search space corresponding thereto in a wireless communication system, comprising:
 - transmitting a configuration of a control resource set, wherein the control resource set is in a control region including time and frequency resources, and the
 - transmitting a configuration of the control resource set includes at least one of:
 - transmitting an indication of a starting symbol of the search space in the control resource set,
 - transmitting an indication of a number of symbols of the control resource set,
 - transmitting an indication of physical resource blocks (PRBs) in the control resource set, or
 - transmitting an indication of CCE to resource element group (REG) mapping; and
 - transmitting a control channel on the control resource set in accordance with the configuration of the control resource set.
2. The method of claim 1, wherein the configuration of the control resource set further includes at least one of following:
 - an indication of REG/CCE mapping to physical resource elements,
 - an indication of a transmit diversity scheme,
 - an indication of reference signal allocation,
 - an indication of physical resource block (PRB) bundling, oror
any combination thereof.
3. The method of claim 1,
 - wherein the indication of REG/CCE mapping to physical resource elements includes a localized mapping or a distributed mapping.
4. The method of claim 2,
 - wherein the indication of PRB bundling includes a size of a PRB bundle.
5. The method of claim 1, wherein the control resource set is a first control resource set, and the search space is a first search space, and the method further comprises:
 - transmitting a configuration of a second control resource set,
 - wherein transmitting the control channel includes transmitting one or more control channels according to the configuration of the first control resource set, the configuration of the second resource set, or both of the configurations of the first and second control resource sets.
6. A method for a user device in a wireless communication system, comprising:
 - receiving a configuration of a control resource set and a configuration of a search space corresponding thereto, wherein the control resource set is in a control region including time and frequency resources, and the receiving a

configuration of a control resource set and a configuration of a search space corresponding thereto includes at least one of:

- receiving an indication of a starting symbol of the search space in the control resource set,
- receiving an indication of a number of symbols of the control resource set,
- receiving an indication of physical resource blocks (PRBs) in the control resource set, or
- receiving an indication of CCE to resource element group (REG) mapping; and

detecting a control channel on the control resource set in accordance with the configuration of the control resource set.

7. The method of claim 6,
wherein the configuration of the control resource set further includes at least one of following:
 - an indication of REG/CCE mapping to physical resource elements,
 - an indication of a transmit diversity scheme,
 - an indication of reference signal allocation,
 - an indication of physical resource block (PRB) bundling, or
 - any combination thereof.
8. The method of claim 6,
wherein the indication of REG/CCE mapping to physical resource elements includes a localized mapping or a distributed mapping.
9. The method of claim 7,
wherein the indication of PRB bundling includes a size of a PRB bundle.
10. The method of claim 6, wherein the control resource set is a first control resource set, and the search space is a first search space, the method further comprises:
 - receiving a configuration of a second control resource set,
 - wherein detecting the control channel includes detecting one or more control channels according to the configuration of the first control resource set, the configuration of the second resource set, or both of the configurations of the first and second control resource sets.
11. A network apparatus, comprising:
 - a memory storing instructions; and
 - a processor communicatively coupled to the memory,wherein the instructions, when executed by the processor, cause the network apparatus to perform operations including:
 - transmitting a configuration of a control resource set, wherein the control resource set is in a control region including time and frequency resources, and the transmitting a configuration of a control resource set includes at least one of:

transmitting an indication of a starting symbol of a search space in the control resource set,
transmitting an indication of a number of symbols of the control resource set,
transmitting an indication of physical resource blocks (PRBs) in the control resource set, or
transmitting indication of CCE to resource element group (REG) mapping; and
transmitting a control channel on the control resource set according to the configuration of the control resource set.

12. The apparatus of claim 11, wherein the configuration of the control resource set further includes at least one of following:
 - an indication of REG/CCE mapping to physical resource elements,
 - an indication of a transmit diversity scheme,
 - an indication of reference signal allocation,
 - an indication of physical resource block (PRB) bundling, or
 - any combination thereof.
13. The network apparatus of claim 11,
 - wherein the indication of REG/CCE mapping to physical resource elements includes a localized mapping or a distributed mapping.
14. The network apparatus of claim 12,
 - wherein the indication of PRB bundling includes a size of a PRB bundle.
15. The network apparatus of claim 11, wherein the control resource set is a first control resource set, and the search space is a first search space, and the operations performed by the processor further comprise:
 - transmitting a configuration of a second control resource set,
 - wherein transmitting the control channel includes transmitting one or more control channels according to the configuration of the first control resource set, the configuration of the second resource set, or both of the configurations of the first and second control resource sets.
16. A user device, comprising:
 - a memory storing instructions; and
 - a processor communicatively coupled to the memory,
 - wherein the instructions, when executed by the processor, cause the processor to perform operations including:
 - receiving a configuration of a control resource set and a configuration of a search space corresponding thereto, wherein the control resource set is in a control region including time and frequency resources, and the receiving a configuration of a control resource set and a configuration of a search space corresponding thereto includes at least one of:

receiving an indication of a starting symbol of the search space in the control resource set,
receiving an indication of a number of symbols of the control resource set,
receiving an indication of physical resource blocks (PRBs) in the control resource set, or
receiving an indication of CCE to resource element group (REG) mapping; and
detecting a control channel on the control resource set in accordance with the configuration of the control resource set.

17. The user device of claim 16, wherein the configuration of the control resource set further includes at least one of following:
 - an indication of REG/CCE mapping to physical resource elements,
 - an indication of a transmit diversity scheme,
 - an indication of reference signal allocation,
 - an indication of physical resource block (PRB) bundling, or
 - any combination thereof.
18. The user device of claim 16,
 - wherein the indication of REG/CCE mapping to physical resource elements includes a localized mapping or a distributed mapping.
19. The user device of claim 17,
 - wherein the indication of PRB bundling includes a size of a PRB bundle.
20. The user device of claim 16, wherein the control resource set is a first control resource set, and the search space is a first search space, and the operations performed by the processor further comprise:
 - receiving a configuration of a second control resource set,
 - wherein detecting the control channel includes detecting one or more control channels according to the configuration of the first control resource set, the configuration of the second resource set, or both of the configurations of the first and second control resource sets.