

CLAIMS

1.——_A method of wireless communication by a user equipment, (UE), comprising:

——_obtaining configuration information for receiving at least one wake up signal (WUS) during an OFF duration of a discontinuous reception (DRX) mode of the UE;

——_, wherein: the configuration information comprises at least one of: a UE-specific resource hopping pattern comprising a recurring set of UE-specific resources assigned to the UE for receiving the at least one WUS, or a scrambling sequence hopping pattern comprising a recurring set of scrambling sequences assigned to the UE for receiving the at least one WUS; and the configuration information indicates at least one of a length of time that the recurring set of UE-specific resources are assigned to the UE in the UE-specific hopping pattern or a length of time that the recurring set of scrambling sequences are assigned to the UE in the scrambling sequence hopping pattern; monitoring, during a WUS monitoring occasion occurring during the OFF duration of the DRX mode, for the at least one WUS based on the configuration information; and transitioning to an ON state of the DRX mode when the at least one WUS is detected based on the configuration information during the monitoring; or remaining in an OFF state of the DRX mode when the at least one WUS is not detected based on the configuration information during the monitoring.

——_~~transitioning to an ON state of the DRX mode when the at least one WUS is detected in the one or more resources during the monitoring; or~~

——_~~remaining in an OFF state of the DRX mode when the at least one WUS is not detected in the one or more resources during the monitoring.~~

2.——_The method of claim 1, wherein:

——_~~the configuration information indicates a UE-specific hopping pattern;~~

——_~~the UE-specific hopping pattern indicates one or more resources to receive the at least one WUS; and~~

_monitoring for the at least one WUS comprises monitoring the ~~one or more recurring set of~~ resources for the at least one WUS based on the UE-specific resource hopping pattern.

3.——_The method of claim 2, wherein:

——_the at least one WUS comprises at least one physical downlink control channel (PDCCH)-based WUS; and

——_the UE-specific resource hopping pattern comprises at least one of a search-space hopping pattern or a CORESET hopping pattern.

4. ~~— The method of claim 2, wherein the configuration information further comprises a periodicity corresponding to the one or more resources to receive the at least one WUS in the UE-specific hopping pattern.~~

5. ~~— The method of claim 4, wherein monitoring comprises:~~

~~— switching from monitoring for the at least one WUS in a first resource of the one or more recurring set of resources to monitoring for the at least one WUS in a second resource of the one or more recurring set of resources based, at least in part, on the periodicity corresponding to length of time that the at least one or more resources and the UE-specific hopping pattern is assigned to the UE.~~

6. ~~— 5.~~ The method of claim 1, wherein the DRX mode comprises one of:

~~— a connected mode DRX (CDRX) mode; or~~

an idle mode DRX (IDRX) mode.

7. ~~— 6.~~ The method of claim 1, wherein the configuration information is obtained in one of:

~~— a radio resource control (RRC) message;~~

~~— a media access control control element (MAC-CE); or~~

~~— a physical downlink control channel (PDCCH) message.~~

8. ~~— 7.~~ The method of claim 1, wherein:

~~— the configuration information indicates a scrambling sequence hopping pattern; and~~

~~— the UE shares one or more resources for receiving the at least one WUS with one or more other UEs;~~

~~the scrambling sequence hopping pattern indicates a set of scrambling sequences assigned to the UE for receiving the at least one WUS in the one or more shared resources; and~~

and monitoring for the at least one WUS comprises monitoring the shared one or more resources for the at least one WUS based on the scrambling sequence hopping pattern.

9. ~~— 8.~~ The method of claim 8, wherein:

~~— the WUS is scrambled with a scrambling sequence in the recurring set of resources~~

assigned to the UE; and

———_monitoring comprises monitoring the one or more shared resources for the at least one WUS scrambled with the scrambling sequence in the recurring set of resources assigned to the UE.

~~10. — The method of claim 9.~~ The method of claim 8, wherein transitioning to the ON state of the DRX mode comprises:

_receiving a signal transmitted in the one or more shared resources;

_determining that the signal is scrambled with the scrambling sequence in the recurring set of resources assigned to the UE;

_detecting the at least one WUS by decoding the signal based on the determination;

and

transitioning to the ON state of the DRX mode based on the detection of the at least one WUS.

~~11. — 10.~~ The method of claim 9, wherein remaining in the OFF state of the DRX mode comprises:

_receiving a signal transmitted in the one or more shared resources;

_determining that the signal is not scrambled with the scrambling sequence in the recurring set of resources assigned to the UE;

———_detecting that the signal does not contain a WUS intended for the UE based on the determination; and

_remaining in the OFF state of the DRX mode based on the detection.

~~12. — 11.~~ The method of claim 8, wherein:

_the at least one WUS comprises at least one physical downlink control channel (PDCCH)-based WUS;

the at least one PDCCH-based WUS comprises at least one of:

_a demodulation reference signal (DMRS), transmitted on a PDCCH in the one or more shared resources, scrambled with a scrambling sequence ~~from~~ in the recurring set scrambling sequences assigned to the UE; or

———_a downlink control information (DCI) message, transmitted on the PDCCH in the one or more shared resources, scrambled with a scrambling sequence ~~from~~ in the recurring set of scrambling sequences assigned to the UE; and

_monitoring the one or more shared resources for the at least one WUS comprises monitoring for at least one of the DMRS scrambled with the scrambling sequence or the DCI message scrambled with the scrambling sequence.

~~13. — 12.~~ The method of claim 8, ~~wherein the configuration information further comprises a periodicity for each scrambling sequence in the set of scrambling sequences assigned to the UE for receiving the at least one WUS in the one or more shared resources.~~

14. — ~~The method of claim 137, wherein monitoring comprises:~~

~~—— switching from monitoring for the at least one WUS using a first scrambling sequence of the recurring set of scrambling sequences to monitoring for the at least one WUS using a second scrambling sequence of the recurring set of scrambling sequences based, at least in part, on the periodicity corresponding length of time that the at least one hopping pattern is assigned to the first scrambling sequence and the second scrambling sequence UE.~~

15. — 13. A method of wireless communication by a base station, comprising:

—— determining configuration information for receiving, at a user equipment (UE), at least one wake up signal (WUS) during an OFF duration of a discontinuous reception (DRX) mode of the UE; wherein: the configuration information comprises at least one of: a UE-specific resource hopping pattern comprising a recurring set of UE-specific resources assigned to the UE for receiving the at least one WUS, or a scrambling sequence hopping pattern comprising a recurring set of scrambling sequences assigned to the UE for receiving the at least one WUS; and the configuration information indicates at least one of a length of time that the recurring set of UE-specific resources are assigned to the UE in the UE-specific hopping pattern or a length of time that the recurring set of scrambling sequences are assigned to the UE in the scrambling sequence hopping pattern; transmitting the configuration information to the UE; and transmitting the at least one WUS in one or more resources based on the configuration information.

~~—— transmitting the configuration information to the UE; and~~

~~—— transmitting the at least one WUS in one or more resources based on the configuration information.~~

16. — 14. The method of claim 1513, wherein:

the configuration information indicates a UE-specific hopping pattern; and

~~—— the UE-specific hopping pattern indicates one or more resources to receive the at least one WUS;~~

17. — ~~The method of claim 16, wherein:~~

~~—— the at least one WUS comprises at least one physical downlink control channel (PDCCH)-based WUS; and~~

~~—— the UE-specific resource hopping pattern comprises at least one of a search-space hopping pattern or a CORESET hopping pattern.~~

18.—~~15.~~ The method of claim ~~16~~, wherein the configuration information further comprises a ~~periodicity corresponding to the one or more resources to receive the at least one WUS in the UE-specific hopping pattern.~~

19.—~~The method of claim 18~~13, wherein transmitting the at least one WUS comprises:

——~~_switching from transmitting the at least one WUS in a first resource of the one or more recurring set of resources to transmitting the at least one WUS in a second resource of the one or more recurring set of resources based, at least in part, on the periodicity corresponding to~~length of time that the at least one or more resources and the UE-specific hopping pattern is assigned to the UE.

20.—~~16.~~ The method of claim ~~15~~13, wherein:

——~~the configuration information indicates a scrambling sequence hopping pattern;~~

——~~the UE shares one or more resources for receiving the at least one WUS with one or more other UEs; and~~

~~the scrambling sequence hopping pattern indicates a set of scrambling sequences assigned to the UE for receiving the at least one WUS in the one or more shared resources.~~

21.—~~17.~~ The method of claim ~~20~~16, wherein transmitting the at least one WUS comprises:

~~_scrambling the WUS with a scrambling sequence~~ in the recurring set of resources assigned to the UE; and

~~_transmitting the at least one WUS scrambled with the scrambling sequence~~ in the recurring set of resources assigned to the UE.

22.—~~18.~~ The method of claim ~~20~~16, wherein the at least one WUS comprises at least one physical downlink control channel (PDCCH)-based WUS.

23.—~~19.~~ The method of claim ~~20~~16, wherein the at least one PDCCH-based WUS comprises at least one of:

~~_a demodulation reference signal (DMRS), transmitted on a PDCCH in the one or more shared resources, scrambled with a scrambling sequence~~ from in the recurring set of scrambling sequences assigned to the UE; or

——~~a downlink control information (DCI) message, transmitted on the PDCCH in the one or more shared resources, scrambled with a scrambling sequence~~ from in the recurring set of scrambling sequences assigned to the UE.

~~24.—20. The method of claim 20, wherein the configuration information further comprises a periodicity for each scrambling sequence in the set of scrambling sequences assigned to the UE for receiving the at least one WUS in the one or more shared resources.~~

~~25.—The method of claim 2416, wherein transmitting the at least one WUS comprises:
 —switching from transmitting the at least one WUS using a first scrambling sequence ~~ofin~~ the recurring set of scrambling sequences to transmitting the at least one WUS using a second scrambling sequence ~~ofin~~ the recurring set of scrambling sequences based, at least in part, on the periodicity corresponding length of time that the at least one hopping pattern is assigned to the first scrambling sequence and the second scrambling sequenceUE.~~

~~26.—21. The method of claim 1513, wherein the configuration information is transmitted in one of:~~

- ~~——a radio link control (RLC) message;~~
- ~~——a media access control control element (MAC-CE); or~~
- ~~——a physical downlink control channel (PDCCH) message.~~

~~27.—22. An apparatus for wireless communication by a user equipment; (UE), comprising:~~

~~——at least one processor configured to:~~

~~—obtain configuration information receiving at least one wake up signal (WUS) during an OFF duration of a discontinuous reception (DRX) mode of the UE;~~

~~, wherein: the configuration information comprises at least one of: a UE-specific resource hopping pattern comprising a recurring set of UE-specific resources assigned to the UE for receiving the at least one WUS, or a scrambling sequence hopping pattern comprising a recurring set of scrambling sequences assigned to the UE for receiving the at least one WUS; and the configuration information indicates at least one of a length of time that the recurring set of UE-specific resources are assigned to the UE in the UE-specific hopping pattern or a length of time that the recurring set of scrambling sequences are assigned to the UE in the scrambling sequence hopping pattern; monitor, during a WUS monitoring occasion occurring during the OFF duration of the DRX mode, for the at least one WUS based on the configuration information; transition to an ON state of the DRX mode when the at least one WUS is detected based on the configuration information during the monitoring; or remain in an OFF state of the DRX mode when the at least one WUS is not detected based on the configuration information during the monitoring; and a memory coupled with the at least one processor.~~

~~transition to an ON state of the DRX mode when the at least one WUS is detected in the one or more resources during the monitoring; and~~

~~remain in an OFF state of the DRX mode when the at least one WUS is not detected in the one or more resources during the monitoring; and~~

~~a memory coupled with the at least one processor.~~

28. — The apparatus of claim 27, wherein at least one of:

~~the configuration information indicates a UE-specific hopping pattern and the UE-specific hopping pattern indicates one or more resources to receive the at least one WUS; or~~

~~the configuration information indicates a scrambling sequence hopping pattern;~~

~~the UE shares one or more resources for receiving the at least one WUS with one or more other UEs; and~~

~~the scrambling sequence hopping pattern indicates a set of scrambling sequences assigned to the UE for receiving the at least one WUS in the one or more shared resources.~~

29. — 23. An apparatus for wireless communication by a base station, comprising:

~~at least one processor configured to:~~

~~determine configuration information for receiving, at a user equipment (UE), at least one wake up signal (WUS) during an OFF duration of a discontinuous reception (DRX) mode of the UE; wherein: the configuration information comprises at least one of: a UE-specific resource hopping pattern comprising a recurring set of UE-specific resources assigned to the UE for receiving the at least one WUS, or a scrambling sequence hopping pattern comprising a recurring set of scrambling sequences assigned to the UE for receiving the at least one WUS; and the configuration information indicates at least one of a length of time that the recurring set of UE-specific resources are assigned to the UE in the UE-specific hopping pattern or a length of time that the recurring set of scrambling sequences are assigned to the UE in the scrambling sequence hopping pattern; transmit the configuration information to the UE; and transmit the at least one WUS in one or more resources based on the configuration information.~~

~~transmit the configuration information to the UE; and~~

~~transmit the at least one WUS in one or more resources based on the configuration information.~~

30. — 24. The apparatus method of claim 29¹, wherein at least one of:

~~the configuration information indicates a UE-specific resource hopping pattern and this is different from other UE-specific resource hopping pattern indicates one or more resources to receive the at least one WUS; or~~

~~the configuration information indicates a patterns for other UEs, or the scrambling sequence hopping pattern;~~

~~the UE shares one or more resources for receiving the at least one WUS with one or more other UEs; and~~

~~the is different from other scrambling sequence hopping pattern indicates a set of scrambling sequences assigned to the UE for receiving the at least one WUS in the one or more shared resources; patterns for other UEs.~~

25. The method of claim 1, wherein: the UE shares a DRX cycle with at least one other UE, and at least one of: resources in the recurring set of resources assigned to the UE for receiving the at least one WUS do not conflict with resources in another recurring set of resources assigned to another UE for receiving another WUS during the shared DRX cycle, or scrambling sequences in the recurring set of scrambling sequences assigned to the UE for receiving the at least one WUS do not conflict with scrambling sequences in another recurring set of scrambling sequences assigned to another UE for receiving another WUS during the shared DRX cycle.