CLAIMS

~~**WHAT IS CLAIMED IS:**~~

1.~~——~~ A method for wireless communications by a user equipment (UE), comprising:

~~———~~ determining a quasi-co-location (QCL) relationship of an aperiodic channel state information (CSI) reference signal (CSI-RS) to a physical channel~~; and~~

~~———~~ ~~processing the aperiodic CSI-RS according to the determined QCL relationship.~~

~~2. The method of claim 1~~, wherein ~~determining~~ : the determination of the QCL relationship is based on:

~~———~~an offset parameter related to the aperiodic CSI-RS and a downlink control information (DCI) scheduling the aperiodic CSI-RS, and

~~———~~ ~~a threshold value.~~

~~3. The method of claim 2~~a threshold value of a time for the UE to switch between receive beams, and determining the QCL relationship comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of a control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is lower than the threshold value; and processing the aperiodic CSI-RS according to the determined QCL relationship.

2. The method of claim 1, wherein determining the QCL relationship comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of a control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is not yet determined by the UE.

~~4. The method of claim 2, wherein determining the QCL relationship comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of a control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is lower than the threshold.~~

~~5. The method of claim 2~~3. The method of claim 1, wherein determining the QCL relationship comprises determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, wherein the granted time and

frequency resources include time and frequency resources of the aperiodic CSI-RS, when the offset parameter is not yet determined by the UE.

~~6. The method of claim 2, wherein determining the QCL relationship comprises determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, wherein the granted time and frequency resources include time and frequency resources of the aperiodic CSI-RS, when the offset parameter is lower than the threshold.~~

~~7. The method of claim 2~~4. The method of claim 1, wherein determining the QCL relationship comprises determining to use a QCL relationship of a unicast physical downlink shared channel (PDSCH) on a set of time and frequency resources including time and frequency resources of the aperiodic CSI-RS, when the offset parameter is not yet determined by the UE.

~~8. The method of claim 2, wherein determining the QCL relationship comprises determining to use a QCL relationship of a unicast physical downlink shared channel (PDSCH) on a set of time and frequency resources including time and frequency resources of the aperiodic CSI-RS, when the offset parameter is lower than the threshold.~~

~~9. The method of claim 1, wherein determining the QCL relationship comprises:~~
~~determining the QCL relationship based on a QCL relationship for rate-matched resource elements (REs) indicated in a grant for a downlink data channel, wherein processing the aperiodic CSI-RS comprises processing the aperiodic CSI-RS in the rate-matched REs.~~

~~10.~~ 5. A method for wireless communications by a base station (BS), comprising:
determining a quasi-co-location (QCL) relationship of an aperiodic channel state information (CSI) reference signal (CSI-RS) to a physical channel~~; and~~
~~transmitting the aperiodic CSI-RS according to the determined QCL relationship.~~

~~11. The method of claim 10~~, wherein ~~determining~~ : the determination of the QCL relationship is based on:

~~an~~ an offset parameter related to the aperiodic CSI-RS and a downlink control information (DCI) scheduling the aperiodic CSI-RS, and

~~a threshold value.~~

~~12. The method of claim 11~~a threshold value of a time for a user equipment (UE) to switch between receive beams, and determining the QCL relationship comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of a control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is lower than the threshold value; and transmitting, to the UE, the aperiodic CSI-RS according to the determined QCL relationship.

6. The method of claim 5, wherein determining the QCL relationship comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of control resource set (CORESET) having a lowest identifier (CORESET ID), when the offset parameter is not yet determined.

~~13. The method of claim 11, wherein determining the QCL relationship comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of control resource set (CORESET) having a lowest identifier (CORESET ID), when the offset parameter is lower than the threshold.~~

~~14. The method of claim 11~~7. The method of claim 5, wherein determining the QCL relationship comprises determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, wherein the granted time and frequency resources include time and frequency resources of the aperiodic CSI-RS, when the offset parameter is not yet determined.

~~15. The method of claim 11, wherein determining the QCL relationship comprises determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, wherein the granted time and frequency resources include time and frequency resources of the aperiodic CSI-RS, when the offset parameter is lower than the threshold.~~

~~16. The method of claim 11~~8. The method of claim 5, wherein determining the QCL relationship comprises determining to use a QCL relationship of a unicast physical downlink shared channel (PDSCH) on a set of time and frequency resources including time and frequency resources of the aperiodic CSI-RS, when the offset parameter is not yet determined.

~~17. The method of claim 11, wherein determining the QCL relationship comprises determining to use a QCL relationship of a unicast physical downlink shared channel (PDSCH) on a set of time and frequency resources including time and frequency resources of the aperiodic CSI-RS, when the offset parameter is lower than the threshold.~~

~~18. The method of claim 10, wherein determining the QCL relationship comprises~~
~~determining the QCL relationship based on a QCL relationship for resource elements (REs) rate-matched with the physical channel, and the method further comprises:~~
~~transmitting the physical channel according to another QCL relationship.~~

~~19. A method~~9. An apparatus for wireless communications by a ~~base station (BS~~user equipment (UE), comprising:
~~determining~~ a memory; and at least one processor coupled to the memory, the memory and the at least one processor configured to: determine a quasi-co-location (QCL) relationship of an aperiodic ~~sounding~~channel state information (CSI) reference signal (~~SRS~~CSI-RS) to a physical channel~~; and~~
~~processing the aperiodic SRS according to the determined QCL relationship.~~

~~20. The method of claim 19~~, wherein ~~determining~~ : the determination of the QCL relationship is based on:
an offset parameter related to the aperiodic ~~SRS~~CSI-RS and a downlink control information (DCI) scheduling the aperiodic ~~SRS~~CSI-RS, and
a threshold value~~.~~

~~21. The method of claim 20, wherein determining the QCL relationship comprises~~ of a time for the UE to switch between receive beams, and the memory and the at least one processor are further configured to determine the QCL relationship by determining to use a QCL relationship of a physical downlink control channel (PDCCH) of a control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is lower than the threshold value; and process the aperiodic CSI-RS according to the determined QCL relationship.

10. The apparatus of claim 9, wherein the memory and the at least one processor are further configured to determine the QCL relationship by determining to use a QCL relationship of a physical downlink control channel (PDCCH) of a control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is not yet determined~~.~~

~~22. The method of claim 20, wherein determining the QCL relationship comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of~~ by the UE.

11. The apparatus of claim 9, wherein the memory and the at least one processor are further configured to determine the QCL relationship by determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, and wherein the granted time and frequency resources include time and frequency resources of the aperiodic CSI-RS, when the offset parameter is not yet determined by the UE.

12. The apparatus of claim 9, wherein the memory and the at least one processor are further configured to determine the QCL relationship by determining to use a QCL relationship of a unicast physical downlink shared channel (PDSCH) on a set of time and frequency resources including time and frequency resources of the aperiodic CSI-RS, when the offset parameter is not yet determined by the UE.

13. An apparatus for wireless communications by a base station (BS), comprising: a memory; and at least one processor coupled to the memory, the memory and the at least one processor configured to: determine a quasi-co-location (QCL) relationship of an

aperiodic channel state information (CSI) reference signal (CSI-RS) to a physical channel, wherein: the determination of the QCL relationship is based on: an offset parameter related to the aperiodic CSI-RS and a downlink control information (DCI) scheduling the aperiodic CSI-RS, and a threshold value of a time for a user equipment (UE) to switch between receive beams, and the memory and the at least one processor are further configured to determine the QCL relationship by determining to use a QCL relationship of a physical downlink control channel (PDCCH) of a control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is lower than the threshold~~.~~

~~23. The method of claim 20, wherein determining the QCL relationship comprises determining to use a QCL relationship indicated in a grant of time~~ value; and ~~frequency resources of another transmission, wherein the granted time and frequency resources include time and frequency resources of~~transmit, to the UE, the aperiodic ~~SRS, when the offset parameter is not yet determined.~~

~~24. The method of claim 20, wherein determining the QCL relationship comprises determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, wherein the granted time and frequency resources include time and frequency resources of the aperiodic SRS, when the offset parameter is lower than the threshold.~~

~~25. A method for wireless communications by a user equipment (UE), comprising:~~

~~determining a quasi-co-location (QCL) relationship of an aperiodic sounding reference signal (SRS) to a physical channel; and~~

~~transmitting the aperiodic SRS~~CSI-RS according to the determined QCL relationship.

~~26.~~ 14. The ~~method~~apparatus of claim ~~25~~13, wherein ~~determining~~the memory and the at least one processor are further configured to determine the QCL relationship ~~is based on:~~

~~an offset parameter related to the aperiodic SRS and a downlink control information (DCI) scheduling the aperiodic SRS, and~~

~~a threshold value.~~

~~27. The method of claim 26, wherein determining the QCL relationship comprises~~by determining to use a QCL relationship of a physical downlink control channel (PDCCH) of control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is not yet determined ~~by the UE~~.

~~28.~~ 15. The ~~method~~apparatus of claim ~~26~~13, wherein ~~determining~~the memory and the at least one processor are further configured to determine the QCL relationship ~~comprises determining to use a QCL relationship of a physical downlink control channel (PDCCH) of control resource set (CORESET) having a lowest identifier (CORESET-ID), when the offset parameter is lower than the threshold.~~

~~29. The method of claim 26, wherein determining the QCL relationship comprises~~by determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, wherein the granted time and frequency resources include time and frequency resources of the aperiodic ~~SRS~~CSI-RS, when the offset parameter is not yet determined ~~by the UE.~~

~~30. The method of claim 26, wherein determining the QCL relationship comprises determining to use a QCL relationship indicated in a grant of time and frequency resources of another transmission, wherein the granted time and frequency resources include time and frequency resources of the aperiodic SRS, when the offset parameter is lower than the threshold~~.