

~~WHAT IS CLAIMED IS:~~

CLAIMS

1. — A method of wireless communication, comprising:
transmitting a configuration message, by a base station to a user equipment (UE), that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE; ~~and~~
receiving one or more SRS, by the base station, transmitted by the UE according to the configuration of the multiple SRS resource sets; and

2. — ~~The method of claim 1, further comprising:~~
receiving, by the base station from the UE, a capability message indicating the one or more antenna switching constraints, wherein the one or more antenna switching constraints include an antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.

3. — 2. The method of claim 1, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:
the UE will not be configured with multiple SRS resource sets for antenna switching -unless all are of a same antenna switching type;
~~the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot;~~
the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

4. — 3. The method of claim 3, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.

5. ~~4.~~ The method of ~~claim 43~~, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

6. ~~5.~~ The method of ~~claim 43~~, wherein the same antenna switching type is selected from the group consisting of:

a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;

a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;

a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;

a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'aperiodic' with a total of four SRS resources transmitted in different symbols of two different slots, wherein:

an SRS port of each SRS resource is associated with a different UE antenna port, and at least one of:

the two SRS resource sets are each configured with two SRS resources, or

one set is configured with one SRS resource and another set is configured with three SRS resources; or

~~— a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

7. ~~The method of claim 3, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

~~8. The method of claim 3~~ a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

6. The method of claim 2, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.

~~9. The method of claim 8~~ 6, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.

~~10. A method of wireless communication, comprising:~~
 receiving a configuration message, by a user equipment (UE) from a base station, that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE; ~~and~~
 transmitting one or more SRS, by the UE to the base station, according to the configuration of the multiple SRS resource sets; and

~~11. The method of claim 10, further comprising:~~
 —transmitting, by the UE to the base station, a capability message indicating the antenna switching constraints, wherein the one or more antenna switching constraints include an antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.

~~12. The method of claim 10~~ 8, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:
 the UE will not be configured with multiple SRS resource sets for antenna switching -unless all are of a same antenna switching type;

~~the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot;~~

the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

~~13.~~ 10. The method of ~~claim 129~~, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.

~~14.~~ 11. The method of ~~claim 1310~~, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

~~15.~~ 12. The method of ~~claim 1310~~, wherein the same antenna switching type is selected from the group consisting of:

a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;

a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;

a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;

a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'aperiodic' with a total of four SRS resources transmitted in different symbols of two different slots, wherein:

an SRS port of each SRS resource is associated with a different UE antenna port, and at least one of:

the two SRS resource sets are each configured with two SRS resources, or

one set is configured with one SRS resource and another set is configured with three SRS resources, or

~~—— a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

~~16. — The method of claim 12, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

~~17. — The method of claim 12~~13. The method of claim 9, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.

~~18. — 14.~~ The method of claim ~~17~~13, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter resourceType in SRS-ResourceSet set to ‘periodic’ or ‘semi-persistent’ with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.

~~19. — 15.~~ An apparatus for wireless communication, comprising:
means for transmitting a configuration message, by a base station to a user equipment (UE), that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE;~~and~~

means for receiving one or more SRS, by the base station, transmitted by the UE according to the configuration of the multiple SRS resource sets; and

~~20.—The apparatus of claim 19, further comprising:~~

~~——means for receiving, by the base station from the UE, a capability message indicating the antenna switching constraints, wherein the one or more antenna switching constraints include an antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

~~21.—16.~~ The apparatus of ~~claim 19~~15, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:

the UE will not be configured with multiple SRS resource sets for antenna switching ~~unless all are of a same antenna switching type;~~

~~——the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot;~~

the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

~~22.—17.~~ The apparatus of ~~claim 21~~16, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.

~~23.—18.~~ The apparatus of ~~claim 22~~17, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

~~24.—19.~~ The apparatus of ~~claim 22~~17, wherein the same antenna switching type is selected from the group consisting of:

a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of

the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;

a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;

a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;

a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'aperiodic' with a total of four SRS resources transmitted in different symbols of two different slots, wherein:

an SRS port of each SRS resource is associated with a different UE antenna port, and
at least one of:

the two SRS resource sets are each configured with two SRS resources, or

one set is configured with one SRS resource and another set is configured with three SRS resources; or

~~—— a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

~~25.——20. The apparatus of claim 21, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

~~26.——The apparatus of claim 21~~16, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.

~~27.~~—21. The apparatus of ~~claim 26~~20, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter resourceType in SRS-ResourceSet set to ‘periodic’ or ‘semi-persistent’ with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.

~~28.~~—22. An apparatus for wireless communication, comprising:
means for receiving a configuration message, by a user equipment (UE) from a base station, that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE; ~~and~~
means for transmitting one or more SRS, by the UE to the base station, according to the configuration of the multiple SRS resource sets; ~~and~~ and

~~29.~~—The apparatus of ~~claim 28~~, further comprising:
——means for transmitting, by the UE to the base station, a capability message indicating the antenna switching constraints, wherein the one or more antenna switching constraints include an antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.

~~30.~~—23. The apparatus of ~~claim 28~~22, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:
the UE will not be configured with multiple SRS resource sets for antenna switching -unless all are of a same antenna switching type;
——~~the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching~~ on a same slot;
the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

~~31.~~—24. The apparatus of ~~claim 30~~, ~~wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS~~

~~resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.~~

32. ~~The apparatus of claim 31~~23, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

33. ~~25.~~ The apparatus of ~~claim 31~~23, wherein the same antenna switching type is selected from the group consisting of:

a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;

a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;

a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;

a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'aperiodic' with a total of four SRS resources transmitted in different symbols of two different slots, wherein:

an SRS port of each SRS resource is associated with a different UE antenna port, and at least one of:

the two SRS resource sets are each configured with two SRS resources, or

one set is configured with one SRS resource and another set is configured with three SRS resources, or

~~— a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

~~34.—The apparatus of claim 30, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

~~35.—The apparatus of claim 30~~26. The apparatus of claim 23, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.

~~36.—27. The apparatus of claim 35~~26, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter resourceType in SRS-ResourceSet set to ‘periodic’ or ‘semi-persistent’ with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.

~~37.—28. An apparatus for wireless communication, comprising:~~

at least one computer processor; and

at least one memory coupled to the at least one computer processor, wherein the at least one computer processor is configured to:

transmit a configuration message, by a base station to a user equipment (UE), that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE;~~and~~

receive one or more SRS, by the base station, transmitted by the UE according to the configuration of the multiple SRS resource sets;

~~38.—The apparatus of claim 37, wherein the at least one computer processor is further configured to:~~

———receive, by the base station from the UE, a capability message indicating the one or more antenna switching constraints, wherein the one or more antenna switching constraints include an

antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.

39.—29. The apparatus of claim 37~~28~~, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:
the UE will not be configured with multiple SRS resource sets for antenna switching -unless all are of a same antenna switching type;

——~~the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot;~~

the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

40.—30. The apparatus of claim 39~~29~~, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.

41.—31. The apparatus of claim 40~~30~~, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

42.—32. The apparatus of claim 40~~30~~, wherein the same antenna switching type is selected from the group consisting of:

a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;

a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;

a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;

a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'aperiodic' with a total of four SRS resources transmitted in different symbols of two different slots, wherein:

an SRS port of each SRS resource is associated with a different UE antenna port, and

at least one of:

the two SRS resource sets are each configured with two SRS resources, or

one set is configured with one SRS resource and another set is configured with three SRS resources; or

~~—— a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

~~43. — The apparatus of claim 39, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

~~44. — The apparatus of claim 39~~a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

33. The apparatus of claim 29, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.

~~45. — 34. The apparatus of claim 44~~33, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each

SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.

46.—~~35.~~ An apparatus for wireless communication, comprising:

at least one computer processor; and

at least one memory coupled to the at least one computer processor, wherein the at least one computer processor is configured to:

receive a configuration message, by a user equipment (UE) from a base station, that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE; ~~and~~

transmit one or more SRS, by the UE to the base station, according to the configuration of the multiple SRS resource sets; and

47.—~~The apparatus of claim 46, wherein the at least one computer processor is further configured to:~~

—~~transmit, by the UE to the base station, a capability message indicating the antenna switching constraints, wherein the one or more antenna switching constraints include an antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

48.—~~36.~~ The apparatus of ~~claim 46~~~~35~~, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:

the UE will not be configured with multiple SRS resource sets for antenna switching -unless all are of a same antenna switching type;

—~~the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot;~~

the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

49.—37. The apparatus of claim 4836, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.

50.—38. The apparatus of claim 4937, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

51.—39. The apparatus of claim 4937, wherein the same antenna switching type is selected from the group consisting of:

a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;

a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;

a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;

a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'aperiodic' with a total of four SRS resources transmitted in different symbols of two different slots, wherein:

an SRS port of each SRS resource is associated with a different UE antenna port, and at least one of:

the two SRS resource sets are each configured with two SRS resources, or

one set is configured with one SRS resource and another set is configured with three SRS resources, or

~~— a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

~~52.—The apparatus of claim 48, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

~~53.—The apparatus of claim 48~~40. The apparatus of claim 36, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.

~~54.—41. The apparatus of claim 53~~40, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter resourceType in SRS-ResourceSet set to ‘periodic’ or ‘semi-persistent’ with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.

~~55.—42. A non-transitory computer-readable medium having instructions recorded thereon that, when enacted by one or more computer processors, cause the one or more computer processors to:~~
 transmit a configuration message, by a base station to a user equipment (UE), that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE;~~and~~
 receive one or more SRS, by the base station, transmitted by the UE according to the configuration of the multiple SRS resource sets;and

~~56.—The non-transitory computer-readable medium of claim 55, wherein the instructions further cause the one or more computer processor to:~~
 ———receive, by the base station from the UE, a capability message indicating the one or more antenna switching constraints, wherein the one or more antenna switching constraints include an

antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.

57.—43. The non-transitory computer-readable medium of claim 5542, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:

the UE will not be configured with multiple SRS resource sets for antenna switching -unless all are of a same antenna switching type;

——~~the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot;~~

——on a same slot;

the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

58.—44. The non-transitory computer-readable medium of claim 5743, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.

59.—45. The non-transitory computer-readable medium of claim 5844, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

60.—46. The non-transitory computer-readable medium of claim 5844, wherein the same antenna switching type is selected from the group consisting of:

a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;

a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource

of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;

a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;

a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to 'aperiodic' with a total of four SRS resources transmitted in different symbols of two different slots, wherein:

an SRS port of each SRS resource is associated with a different UE antenna port, and
at least one of:

the two SRS resource sets are each configured with two SRS resources, or

one set is configured with one SRS resource and another set is configured with three SRS resources; or

~~—— a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

~~61. — 47. The non-transitory computer-readable medium of claim 57, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

~~62. — The non-transitory computer-readable medium of claim 57 43, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.~~

~~63. — 48. The non-transitory computer-readable medium of claim 62 47, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter~~

resourceType in SRS-ResourceSet set to 'periodic' or 'semi-persistent' with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.

~~64.~~—49. A non-transitory computer-readable medium having instructions recorded thereon that, when enacted by one or more computer processors, cause the one or more computer processors to:

receive a configuration message, by a user equipment (UE) from a base station, that configures the UE, according to one or more antenna switching constraints, with multiple sounding reference signal (SRS) resource sets for antenna switching by the UE; ~~and~~
transmit one or more SRS, by the UE to the base station, according to the configuration of the multiple SRS resource sets; and

~~65.~~—~~The non-transitory computer-readable medium of claim 64, wherein the instructions further cause the one or more computer processors to:~~

—transmit, by the UE to the base station, a capability message indicating the antenna switching constraints, wherein the one or more antenna switching constraints include an antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.

~~66.~~—50. The non-transitory computer-readable medium of ~~claim 64~~claim 49, wherein the one or more antenna switching constraints include at least one antenna switching constraint selected from the group consisting of:

the UE will not be configured with multiple SRS resource sets for antenna switching -unless all are of a same antenna switching type;

—~~the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot;~~

the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type on a same slot unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information; or combinations thereof.

~~67.~~—51. The non-transitory computer-readable medium of claim 66~~50~~, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with multiple SRS resource sets for antenna switching unless all of the SRS resource sets are of a same antenna switching type.

~~68.~~—52. The non-transitory computer-readable medium of claim 67~~51~~, wherein the multiple SRS resource sets configured to the UE have different timing behavior.

~~69.~~—53. The non-transitory computer-readable medium of claim 67~~51~~, wherein the same antenna switching type is selected from the group consisting of:

- a type of SRS resource set (1T2R) having two SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of a second resource of the two SRS resources is associated with a different UE antenna port than another SRS port of a first resource of the two SRS resources;
- a type of SRS resource set (2T4R) having two SRS resources transmitted in different symbols, each SRS resource consisting of two SRS ports, wherein an SRS port pair of a second resource of the two SRS resources is associated with a different UE antenna port pair than another SRS port pair of a first resource of the two SRS resources;
- a type of SRS resource set (periodic or semi-persistent 1T4R) configured with a higher layer parameter resourceType in SRS-ResourceSet set to ‘periodic’ or ‘semi-persistent’ with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port;
- a type of SRS resource set (A-1T4R) in which two SRS resource sets are configured with a higher layer parameter resourceType in SRS-ResourceSet set to ‘aperiodic’ with a total of four SRS resources transmitted in different symbols of two different slots, wherein:
 - an SRS port of each SRS resource is associated with a different UE antenna port, and
 - at least one of:
 - the two SRS resource sets are each configured with two SRS resources, or
 - one set is configured with one SRS resource and another set is configured with three SRS resources, or
 - ~~a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.~~

a type of SRS resource set (T=R) having one SRS resource, wherein a number of SRS ports is equal to 1, 2, or 4.

~~70.—54. The non-transitory computer-readable medium of claim 66, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured to transmit SRS resources from multiple SRS resource sets for antenna switching on a same slot.~~

~~71.—The non-transitory computer-readable medium of claim 66~~50, wherein the at least one antenna switching constraint includes the antenna switching constraint that the UE will not be configured with two or more periodic or semi-persistent SRS resource sets for antenna switching of a same antenna switching type unless the two or more periodic or semi-persistent SRS resource sets have different spatial reception information.

~~72.—55. The non-transitory computer-readable medium of claim 71~~54, wherein the same antenna switching type is a type of SRS resource set configured with a higher layer parameter resourceType in SRS-ResourceSet set to ‘periodic’ or ‘semi-persistent’ with four SRS resources transmitted in different symbols, each SRS resource consisting of a single SRS port, wherein an SRS port of each resource is associated with a different UE antenna port.