

WHAT IS CLAIMED IS:**CLAIMS**

1. A method of wireless communication, comprising:
receiving, by a user equipment (UE) from a base station, a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers (CCs);
selecting for transmission, by the UE and in response to the trigger, one or more SRS resource sets for each CC of the group of one or more CCs, wherein at least one CC has multiple SRS resource sets configured for the UE; and
transmitting, by the UE to the base station, one or more SRS on each CC of the group of one or more CCs based on the selecting.
2. The method of claim 1, wherein the selecting includes:
selecting for transmission, for each CC having multiple SRS resource sets configured, at least one of which is for antenna switching, only one or more SRS resource sets that are for antenna switching.
3. The method of claim 2, wherein the selecting includes:
selecting for transmission, for each CC having multiple SRS resource sets configured, all SRS resource sets that are for antenna switching.
4. The method of claim 2, wherein the selecting includes:
selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set for antenna switching that has a smallest index.
5. The method of claim 1, wherein the selecting includes:
selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set having a smallest index.
6. The method of claim 1, further comprising:
receiving, by the UE from the base station, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the selecting includes:
selecting for transmission all SRS resource sets having a same associated triggering state.

7. The method of claim 1, wherein receiving the trigger includes:
receiving a trigger having additional bits therein to specify which SRS resource sets should be selected, wherein the selecting includes:
decoding the trigger with an expectation that it has the additional bits only when the UE has been configured with multiple SRS resource sets for at least one CC, wherein the selecting is performed conditioned on contents of the additional bits.
8. The method of claim 1, further comprising:
receiving, by the UE from the base station, a radio resource control (RRC) message having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs, wherein the selecting is conditioned on configured indices of the SRS resource sets.
9. The method of claim 1, further comprising:
receiving, by the UE from the base station, a radio resource control (RRC) message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.
10. The method of claim 1, further comprising:
receiving, by the UE from the base station via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC, wherein the selecting the one or more SRS resource sets is conditioned on activation of a corresponding SRS resource set index.
11. The method of claim 1, wherein the selecting includes:
selecting for transmission, according to a predetermined sequence, all SRS resource sets configured for each CC.
12. The method of claim 11, wherein the predetermined sequence transmits, one CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.
13. A method of wireless communication, comprising:
transmitting, by a base station to a user equipment (UE), a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers

(CCs), wherein at least one CC has multiple SRS resource sets configured for the UE; and
receiving, by the base station from the UE, one or more SRS on each CC of the group of one or more CCs.

14. The method of claim 13, wherein the receiving includes:
receiving, for each CC having multiple SRS resource sets configured, at least one of which is for antenna switching, one or more SRS transmissions corresponding to only one or more SRS resource sets that are for antenna switching.

15. The method of claim 14, wherein the receiving includes:
receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to all SRS resource sets that are for antenna switching.

16. The method of claim 14, wherein the receiving includes:
receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set for antenna switching that has a smallest index.

17. The method of claim 13, wherein the receiving includes:
receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set having a smallest index.

18. The method of claim 13, further comprising:
transmitting, by the base station to the UE, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the receiving includes:
receiving one or more SRS transmissions corresponding to all SRS resource sets having a same associated triggering state.

19. The method of claim 13, wherein transmitting the trigger includes:
transmitting a trigger having additional bits therein to specify which SRS resource sets should be selected, including transmitting the trigger having the additional bits only when the UE has been configured with multiple SRS resource sets for at least one CC.

20. The method of claim 13, further comprising:
transmitting, by the base station to the UE, a radio resource control (RRC) message

having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs.

21. The method of claim 13, further comprising:

transmitting, by the base station to the UE, a radio resource control (RRC) message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.

22. The method of claim 13, further comprising:

transmitting by the base station to the UE via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC.

23. The method of claim 13, wherein the receiving includes:

receiving, according to a predetermined sequence, one or more SRS transmissions corresponding to all SRS resource sets configured for each CC.

24. The method of claim 23, wherein the predetermined sequence receives, one

CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.

25. An apparatus for wireless communication, comprising:

means for receiving, by a user equipment (UE) from a base station, a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers (CCs);

means for selecting for transmission, by the UE and in response to the trigger, one or more SRS resource sets for each CC of the group of one or more CCs, wherein at least one CC has multiple SRS resource sets configured for the UE; and

means for transmitting, by the UE to the base station, one or more SRS on each CC of the group of one or more CCs based on the selecting.

26. The apparatus of claim 25, wherein the means for selecting includes:

means for selecting for transmission, for each CC having multiple SRS resource sets configured, at least one of which is for antenna switching, only one or more SRS resource sets that are for antenna switching.

27. The apparatus of claim 26, wherein the means for selecting includes:
means for selecting for transmission, for each CC having multiple SRS resource sets configured, all SRS resource sets that are for antenna switching.

28. The apparatus of claim 26, wherein the means for selecting includes:
means for selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set for antenna switching that has a smallest index.

29. The apparatus of claim 25, wherein the means for selecting includes:
means for selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set having a smallest index.

30. The apparatus of claim 25, further comprising:
means for receiving, by the UE from the base station, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the means for selecting includes:
means for selecting for transmission all SRS resource sets having a same associated triggering state.

31. The apparatus of claim 25, wherein the means for receiving the trigger includes:
means for receiving a trigger having additional bits therein to specify which SRS resource sets should be selected, wherein the means for selecting includes:
means for decoding the trigger with an expectation that it has the additional bits only when the UE has been configured with multiple SRS resource sets for at least one CC, wherein the means for selecting selects SRS resource sets conditioned on contents of the additional bits.

32. The apparatus of claim 25, further comprising:
means for receiving, by the UE from the base station, a radio resource control (RRC) message having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs, wherein the means for selecting selects SRS resource sets conditioned on configured indices of the SRS resource sets.

33. The apparatus of claim 25, further comprising:
means for receiving, by the UE from the base station, a radio resource control (RRC)

message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.

34. The apparatus of claim 25, further comprising:

means for receiving, by the UE from the base station via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC, wherein the means for selecting the one or more SRS resource sets is conditioned on activation of a corresponding SRS resource set index.

35. The apparatus of claim 25, wherein the means for selecting includes:

means for selecting for transmission, according to a predetermined sequence, all SRS resource sets configured for each CC.

36. The apparatus of claim 35, wherein the predetermined sequence transmits, one

CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.

37. An apparatus for wireless communication, comprising:

means for transmitting, by a base station to a user equipment (UE), a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers (CCs), wherein at least one CC has multiple SRS resource sets configured for the UE; and

means for receiving, by the base station from the UE, one or more SRS on each CC of the group of one or more CCs.

38. The apparatus of claim 37, wherein the means for receiving includes:

means for receiving, for each CC having multiple SRS resource sets configured, at least one of which is for antenna switching, one or more SRS transmissions corresponding to only one or more SRS resource sets that are for antenna switching.

39. The apparatus of claim 38, wherein the means for receiving includes:

means for receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to all SRS resource sets that are for antenna switching.

40. The apparatus of claim 38, wherein the means for receiving includes:
means for receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set for antenna switching that has a smallest index.

41. The apparatus of claim 37, wherein the means for receiving includes:
means for receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set having a smallest index.

42. The apparatus of claim 37, further comprising:
means for transmitting, by the base station to the UE, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the means for receiving includes:
means for receiving one or more SRS transmissions corresponding to all SRS resource sets having a same associated triggering state.

43. The apparatus of claim 37, wherein the means for transmitting the trigger includes:
means for transmitting a trigger having additional bits therein to specify which SRS resource sets should be selected, including means for transmitting the trigger having the additional bits only when the UE has been configured with multiple SRS resource sets for at least one CC.

44. The apparatus of claim 37, further comprising:
means for transmitting, by the base station to the UE, a radio resource control (RRC) message having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs.

45. The apparatus of claim 37, further comprising:
means for transmitting, by the base station to the UE, a radio resource control (RRC) message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.

46. The apparatus of claim 37, further comprising:
means for transmitting by the base station to the UE via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC.

47. The apparatus of claim 37, wherein the means for receiving includes:
means for receiving, according to a predetermined sequence, one or more SRS transmissions corresponding to all SRS resource sets configured for each CC.

48. The apparatus of claim 47, wherein the predetermined sequence receives, one CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.

49. An apparatus for wireless communication, comprising:
at least one processor; and
at least one memory coupled to the at least one processor, wherein the at least one processor is configured to
receive, by a user equipment (UE) from a base station, a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers (CCs);
select for transmission, by the UE and in response to the trigger, one or more SRS resource sets for each CC of the group of one or more CCs, wherein at least one CC has multiple SRS resource sets configured for the UE; and
transmit, by the UE to the base station, one or more SRS on each CC of the group of one or more CCs based on the selecting.

50. The apparatus of claim 49, wherein the at least one processor is configured to select at least in part by:
selecting for transmission, for each CC having multiple SRS resource sets configured, at least one of which is for antenna switching, only one or more SRS resource sets that are for antenna switching.

51. The apparatus of claim 50, wherein the at least one processor is configured to select at least in part by:
selecting for transmission, for each CC having multiple SRS resource sets configured, all SRS resource sets that are for antenna switching.

52. The apparatus of claim 50, wherein the at least one processor is configured to select at least in part by:

selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set for antenna switching that has a smallest index.

53. The apparatus of claim 49, wherein the at least one processor is configured to select at least in part by:

selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set having a smallest index.

54. The apparatus of claim 49, wherein the at least one processor is further configured to:

receive, by the UE from the base station, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the at least one processor is configured to select at least in part by:

selecting for transmission all SRS resource sets having a same associated triggering state.

55. The apparatus of claim 49, wherein the at least one processor is configured to receive the trigger at least in part by:

receiving a trigger having additional bits therein to specify which SRS resource sets should be selected, wherein the at least one processor is configured to select at least in part by:

decoding the trigger with an expectation that it has the additional bits only when the UE has been configured with multiple SRS resource sets for at least one CC, wherein the at least one processor is configured to select at least in part conditioned on contents of the additional bits.

56. The apparatus of claim 49, wherein the at least one processor is further configured to:

receive, by the UE from the base station, a radio resource control (RRC) message having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs, wherein the selecting is conditioned on configured indices of the SRS resource sets.

57. The apparatus of claim 49, wherein the at least one processor is further configured to:

receive, by the UE from the base station, a radio resource control (RRC) message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.

58. The apparatus of claim 49, wherein the at least one processor is further configured to:

receive, by the UE from the base station via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC, wherein the selecting the one or more SRS resource sets is conditioned on activation of a corresponding SRS resource set index.

59. The apparatus of claim 49, wherein the at least one processor is configured to select at least in part by:

selecting for transmission, according to a predetermined sequence, all SRS resource sets configured for each CC.

60. The apparatus of claim 59, wherein the predetermined sequence transmits, one CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.

61. An apparatus for wireless communication, comprising:

at least one processor; and

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

transmit, by a base station to a user equipment (UE), a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers (CCs), wherein at least one CC has multiple SRS resource sets configured for the UE; and

receive, by the base station from the UE, one or more SRS on each CC of the group of one or more CCs.

62. The apparatus of claim 61, wherein the at least one processor is configured to receive at least in part by:

receiving, for each CC having multiple SRS resource sets configured, at least one of

which is for antenna switching, one or more SRS transmissions corresponding to only one or more SRS resource sets that are for antenna switching.

63. The apparatus of claim 62, wherein the at least one processor is configured to receive at least in part by:

receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to all SRS resource sets that are for antenna switching.

64. The apparatus of claim 62, wherein the at least one processor is configured to receive at least in part by:

receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set for antenna switching that has a smallest index.

65. The apparatus of claim 61, wherein the at least one processor is configured to receive at least in part by:

receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set having a smallest index.

66. The apparatus of claim 61, wherein the at least one processor is further configured to:

transmit, by the base station to the UE, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the at least one processor is configured to receive at least in part by:

receiving one or more SRS transmissions corresponding to all SRS resource sets having a same associated triggering state.

67. The apparatus of claim 61, wherein the at least one processor is configured to transmit the trigger at least in part by:

transmitting a trigger having additional bits therein to specify which SRS resource sets should be selected, including transmitting the trigger having the additional bits only when the UE has been configured with multiple SRS resource sets for at least one CC.

68. The apparatus of claim 61, wherein the at least one processor is further configured to:

transmit, by the base station to the UE, a radio resource control (RRC) message

having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs.

69. The apparatus of claim 61, wherein the at least one processor is further configured to:

transmit, by the base station to the UE, a radio resource control (RRC) message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.

70. The apparatus of claim 61, wherein the at least one processor is further configured to:

transmit, by the base station to the UE via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC.

71. The apparatus of claim 61, wherein the at least one processor is configured to receive at least in part by:

receiving, according to a predetermined sequence, one or more SRS transmissions corresponding to all SRS resource sets configured for each CC.

72. The apparatus of claim 71, wherein the predetermined sequence receives, one CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.

73. 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, by a user equipment (UE) from a base station, a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers (CCs);

select for transmission, by the UE and in response to the trigger, one or more SRS resource sets for each CC of the group of one or more CCs, wherein at least one CC has multiple SRS resource sets configured for the UE; and

transmit, by the UE to the base station, one or more SRS on each CC of the group of one or more CCs based on the selecting.

74. The non-transitory computer-readable medium of claim 73, wherein the instructions cause the one or more computer processors to select at least in part by:

- selecting for transmission, for each CC having multiple SRS resource sets configured, at least one of which is for antenna switching, only one or more SRS resource sets that are for antenna switching.

75. The non-transitory computer-readable medium of claim 74, wherein the instructions cause the one or more computer processors to select at least in part by:

- selecting for transmission, for each CC having multiple SRS resource sets configured, all SRS resource sets that are for antenna switching.

76. The non-transitory computer-readable medium of claim 74, wherein the instructions cause the one or more computer processors to select at least in part by:

- selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set for antenna switching that has a smallest index.

77. The non-transitory computer-readable medium of claim 73, wherein the instructions cause the one or more computer processors to select at least in part by:

- selecting for transmission, for each CC having multiple SRS resource sets configured, only an SRS resource set having a smallest index.

78. The non-transitory computer-readable medium of claim 73, wherein the instructions further cause the one or more computer processors to:

- receive, by the UE from the base station, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the instructions cause the one or more computer processors to select at least in part by:
 - selecting for transmission all SRS resource sets having a same associated triggering state.

79. The non-transitory computer-readable medium of claim 73, wherein the instructions cause the one or more computer processors to receive the trigger at least in part by:

- receiving a trigger having additional bits therein to specify which SRS resource sets should be selected, wherein the instructions cause the one or more computer processors to select at least in part by:
 - decoding the trigger with an expectation that it has the additional bits only

when the UE has been configured with multiple SRS resource sets for at least one CC, wherein the selecting is performed conditioned on contents of the additional bits.

80. The non-transitory computer-readable medium of claim 73, wherein the instructions further cause the one or more computer processors to:

receive, by the UE from the base station, a radio resource control (RRC) message having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs, wherein the selecting is conditioned on configured indices of the SRS resource sets.

81. The non-transitory computer-readable medium of claim 73, wherein the instructions further cause the one or more computer processors to:

receive, by the UE from the base station, a radio resource control (RRC) message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.

82. The non-transitory computer-readable medium of claim 73, wherein the instructions further cause the one or more computer processors to:

receive, by the UE from the base station via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC, wherein the selecting the one or more SRS resource sets is conditioned on activation of a corresponding SRS resource set index.

83. The non-transitory computer-readable medium of claim 73, wherein the instructions cause the one or more computer processors to select at least in part by:

selecting for transmission, according to a predetermined sequence, all SRS resource sets configured for each CC.

84. The non-transitory computer-readable medium of claim 83, wherein the predetermined sequence transmits, one CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.

85. 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, by a base station to a user equipment (UE), a trigger for aperiodic sounding reference signal (SRS) transmission for a group of one or more component carriers (CCs), wherein at least one CC has multiple SRS resource sets configured for the UE; and

receive, by the base station from the UE, one or more SRS on each CC of the group of one or more CCs.

86. The non-transitory computer-readable medium of claim 85, wherein the instructions cause the one or more computer processors to receive one or more SRS at least in part by:

receiving, for each CC having multiple SRS resource sets configured, at least one of which is for antenna switching, one or more SRS transmissions corresponding to only one or more SRS resource sets that are for antenna switching.

87. The non-transitory computer-readable medium of claim 86, wherein the instructions cause the one or more computer processors to receive one or more SRS at least in part by:

receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to all SRS resource sets that are for antenna switching.

88. The non-transitory computer-readable medium of claim 86, wherein the instructions cause the one or more computer processors to receive one or more SRS at least in part by:

receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set for antenna switching that has a smallest index.

89. The non-transitory computer-readable medium of claim 85, wherein the instructions cause the one or more computer processors to receive one or more SRS at least in part by:

receiving, for each CC having multiple SRS resource sets configured, one or more SRS transmissions corresponding to only an SRS resource set having a smallest index.

90. The non-transitory computer-readable medium of claim 85, wherein the instructions further cause the one or more computer processors to:

transmit, by the base station to the UE, a configuration message specifying, for each CC and for each SRS resource set, an associated triggering state, wherein the instructions

cause the one or more computer processors to receive one or more SRS at least in part by:
receiving one or more SRS transmissions corresponding to all SRS resource sets having a same associated triggering state.

91. The non-transitory computer-readable medium of claim 85, wherein the instructions cause the one or more computer processors to transmit the trigger at least in part by:

transmitting a trigger having additional bits therein to specify which SRS resource sets should be selected, including transmitting the trigger having the additional bits only when the UE has been configured with multiple SRS resource sets for at least one CC.

92. The non-transitory computer-readable medium of claim 85, wherein the instructions further cause the one or more computer processors to:

transmit, by the base station to the UE, a radio resource control (RRC) message having at least one parameter to configure one or more indices of the SRS resource sets together with one or more groups of CCs.

93. The non-transitory computer-readable medium of claim 85, wherein the instructions further cause the one or more computer processors to:

transmit, by the base station to the UE, a radio resource control (RRC) message having at least one parameter to configure the SRS resource sets with an indication of which SRS resource set of multiple SRS resource sets configured for a carrier is to be transmitted in the event of aperiodic SRS antenna switching.

94. The non-transitory computer-readable medium of claim 85, wherein the instructions further cause the one or more computer processors to:

transmit by the base station to the UE via at least one media access control (MAC) control element (CE), an activation of one or more SRS resource set indices per CC.

95. The non-transitory computer-readable medium of claim 85, wherein the instructions cause the one or more computer processors to receive one or more SRS at least in part by:

receiving, according to a predetermined sequence, one or more SRS transmissions corresponding to all SRS resource sets configured for each CC.

96. The non-transitory computer-readable medium of claim 95, wherein the predetermined sequence receives, one CC at a time in ascending CC index order, all SRS resource sets configured for each CC in ascending SRS resource set index order.