

1. A wireless communication method for use in a wireless terminal, comprising:
transmitting an uplink, UL, signal,
wherein, based on an event associated with a first downlink, DL, reference signal, RS,
the UL signal is modulated according to a specific carrier frequency.
2. The wireless communication method of claim 1, wherein the event is one of being indicated that the UL signal does not refer to the first DL RS or refers to a local carrier frequency, or the first DL RS is not configured, and
wherein the specific carrier frequency is the local carrier frequency or a carrier frequency of the wireless terminal.
3. The wireless communication method of claim 1, wherein the event is that the UL signal is associated to the first DL RS, and
wherein the specific carrier frequency is a carrier frequency of the first DL RS.
4. The wireless communication method of any of claims 1 to 3, wherein the first DL RS is received no later than or before transmitting the UL signal or a command scheduling the UL signal.
5. The wireless communication method of any of claims 1 to 3, wherein at least one sample of the first DL RS is received no later than or before transmitting the UL signal or a command scheduling the UL signal.
6. The wireless communication method of any of claims 1 to 5, wherein the specific carrier frequency is applied according to an applicable time that is determined according to a command associated with the first DL RS, a command associated with a

parameter state comprising the first DL RS, or at least one sample of the first DL RS.

7. The wireless communication method of claim 6, wherein the UL signal is transmitted no earlier than or after the applicable time; and wherein the specific carrier frequency is a carrier frequency of the first DL RS.
8. The wireless communication method of claim 6, wherein the UL signal is transmitted no later than or before the applicable time; and wherein the specific carrier frequency is not determined according to the first DL RS or is determined according to the most recently used carrier frequency.
9. The wireless communication method of any of claims 1 to 8, wherein the first DL RS is determined according to a first parameter state applied to the UL signal.
10. The wireless communication method of claim 9, wherein the first DL RS is a reference RS in the first parameter state and relates to at least one of a carrier frequency or a Doppler shift.
11. The wireless communication method of claim 9 or 10, wherein the first DL RS is associated with a QCL type parameter comprising at least one of a carrier frequency or a Doppler shift.
12. The wireless communication method of any of claims 9 to 11, wherein the first DL RS is associated with a QCL-TYPEA, a QCL-TYPEB or a QCL-TYPEC.
13. The wireless communication method of any of claims 1 to 12, wherein the first DL RS is configured by a radio resource control, RRC, signaling or activated by a media access control control element, MAC-CE, command.

14. The wireless communication method of claim 13, wherein the RRC signaling or the MAC-CE command is applied for a cell or a carrier component, and wherein the UL signal is in the cell or the carrier component.
15. The wireless communication method of claim 13 or 14, wherein the first DL RS is configured in at least one of physical UL control channel, PUCCH, configuration signaling, a physical UL shared channel, PUSCH, configuration signaling or a sounding reference signal, SRS, configuration signaling, or is configured for at least one of a PUCCH resource, a PUCCH resource group, a PUCCH resource set an SRS resource or an SRS resource set.
16. The wireless communication method of any of claims 1 to 8, wherein the first DL RS is a channel state information, CSI, RS used for tracking or a tracking RS, TRS.
17. The wireless communication method of any of claims 1 to 16, wherein the first DL RS is configured with a physical cell index and a reference RS with regard to a QCL type parameter.
18. The wireless communication method of any of claims 1 to 17, wherein the first DL RS is configured with a second parameter state, and wherein the second parameter state comprises a physical cell index and a reference RS with regard to a QCL type parameter.
19. The wireless communication method of any of claims 1 to 18, wherein a parameter state comprising the first DL RS is activated with a third parameter state which comprises a reference RS with regard to a QCL type parameter.
20. The wireless communication method of claim 19, wherein a QCL assumption of the first DL RS is determined according to the third parameter state, or the third parameter

state is applied to the first DL RS.

21. The wireless communication method of claim 19, wherein the parameter state comprising the first DL RS is activated for a physical DL control channel, PDCCH, a physical DL shared channel, PDSCH, a physical UL control channel, PUCCH, or a physical UL shared channel, PUSCH.
22. The wireless communication method of any of claims 19 to 21, wherein the parameter state comprising the first DL RS is determined based on at least one of:
a hybrid automatic repeat request acknowledge, HARQ-Ack, message corresponding a PDSCH carrying a MAC-CE which activates the parameter state comprising the first DL RS,
a RS transmission occasion, or
DL control information triggering the transmission of the first DL RS.
23. The wireless communication method of any of claims 17 to 22, wherein the QCL type parameter comprises a Doppler shift.
24. The wireless communication method of any of claims 17 to 23, wherein the reference RS is a synchronization signal block, SSB.
25. The wireless communication method of any of claims 1 to 24, wherein a frequency offset parameter is configured or activated for the UL signal, for the first DL RS or for a parameter state comprising the first DL RS, and wherein the UL signal is further modulated according to the frequency offset parameter.
26. The wireless communication method of claim 25, wherein the frequency offset parameter is associated with a time stamp or a time-domain step.
27. The wireless communication method of any of claims 1 to 26, wherein the first DL RS

or a parameter state comprising the first DL RS is associated with a time stamp or a time-domain step.

28. The wireless communication method of claim 26 or 27, wherein the time stamp or the time-domain step is configured by an RRC signaling or a MAC-CE command.
29. The wireless communication method of any of claims 6 to 28, wherein the parameter state is a quasi-co-location, QCL, state, a transmission configuration indicator, TCI, state, spatial relation information, a RS, a reference RS, a physical random access channel, PRACH, a spatial filter or a pre-coding.
30. A wireless communication method for use in a wireless network node, comprising:
transmitting, to a wireless terminal, a first downlink, DL, reference signal, RS, and
receiving, from the wireless terminal, an uplink, UL, signal,
wherein, based on an event associated with the first DL RS, the UL signal is modulated
according to a specific carrier frequency.
31. The wireless communication method of claim 30, wherein the event is one of being
indicated that the UL signal does not refer to the first DL RS or refers to a local carrier
frequency, or the first DL RS is not configured, and
wherein the specific carrier frequency is the local carrier frequency or a carrier
frequency of the wireless terminal.
32. The wireless communication method of claim 30, wherein the event is that the UL
signal is associated to the first DL RS, and
wherein the specific carrier frequency is a carrier frequency of the first DL RS.
33. The wireless communication method of any of claims 30 to 32, wherein the first DL RS
is transmitted no later than or before receiving the UL signal or a command scheduling

the UL signal.

34. The wireless communication method of any of claims 30 to 32, wherein at least one sample of the first DL RS is transmitted no later than or before receiving the UL signal or a command scheduling the UL signal.
35. The wireless communication method of any of claims 30 to 34, wherein the specific carrier frequency is applied according to an applicable time that is determined according to a command associated with the first DL RS, a command associated with a parameter state comprising the first DL RS, or at least one sample of the first DL RS.
36. The wireless communication method of claim 35, wherein the UL signal is received no earlier than or after the applicable time; and
wherein the specific carrier frequency is a carrier frequency of the first DL RS.
37. The wireless communication method of claim 35, wherein the UL signal is received no later than or before the applicable time; and
wherein the specific carrier frequency is not determined according to the first DL RS or is determined according to the most recently used carrier frequency.
38. The wireless communication method of any of claims 30 to 37, wherein the first DL RS is determined according to a first parameter state applied to the UL signal.
39. The wireless communication method of claim 38, wherein the first DL RS is a reference RS in the first parameter state and relates to at least one of a carrier frequency or a Doppler shift.
40. The wireless communication method of claim 38 or 39, wherein the first DL RS is associated with a QCL type parameter comprising at least one of a carrier frequency or

a Doppler shift.

41. The wireless communication method of any of claims 38 to 40, wherein the first DL RS is associated with a QCL-TYPEA, a QCL-TYPEB or a QCL-TYPEC.
42. The wireless communication method of any of claims 30 to 41, wherein the first DL RS is configured by a radio resource control, RRC, signaling or activated by a media access control control element, MAC-CE, command.
43. The wireless communication method of claim 42, wherein the RRC signaling or the MAC-CE command is applied for a cell or a carrier component, and wherein the UL signal is in the cell or the carrier component.
44. The wireless communication method of claim 42 or 43, wherein the first DL RS is configured in at least one of physical UL control channel, PUCCH, configuration signaling, a physical UL shared channel, PUSCH, configuration signaling or a sounding reference signal, SRS, configuration signaling, or is configured for at least one of a PUCCH resource, a PUCCH resource group, a PUCCH resource set an SRS resource or an SRS resource set.
45. The wireless communication method of any of claims 30 to 37, wherein the first DL RS is a channel state information, CSI, RS used for tracking or a tracking RS, TRS.
46. The wireless communication method of any of claims 30 to 45, wherein the first DL RS is configured with a physical cell index and a reference RS with regard to a QCL type parameter.
47. The wireless communication method of any of claims 30 to 46, wherein the first DL RS is configured with a second parameter state, and wherein the second parameter state comprises a physical cell index and a reference RS with regard to a QCL type

parameter.

48. The wireless communication method of any of claims 30 to 47, wherein a parameter state comprising the first DL RS is activated with a third parameter state which comprises a reference RS with regard to a QCL type parameter.
49. The wireless communication method of claim 48, wherein a QCL assumption of the first DL RS is determined according to the third parameter state, or the third parameter state is applied to the first DL RS.
50. The wireless communication method of claim 48, wherein the parameter state comprising the first DL RS is activated for a physical DL control channel, PDCCH, a physical DL shared channel, PDSCH, a physical UL control channel, PUCCH, or a physical UL shared channel, PUSCH.
51. The wireless communication method of any of claims 48 to 50, wherein the parameter state comprising the first DL RS is determined based on at least one of:
a hybrid automatic repeat request acknowledge, HARQ-Ack, message corresponding a PDSCH carrying a MAC-CE which activates the parameter state comprising the first DL RS,
a RS transmission occasion, or
DL control information triggering the transmission of the first DL RS.
52. The wireless communication method of any of claims 46 to 51, wherein the QCL type parameter comprises a Doppler shift.
53. The wireless communication method of any of claims 46 to 52, wherein the reference RS is a synchronization signal block, SSB.
54. The wireless communication method of any of claims 30 to 53, wherein a frequency

offset parameter is configured or activated for the UL signal, for the first DL RS or for a parameter state comprising the first DL RS, and wherein the UL signal is further modulated according to the frequency offset parameter.

55. The wireless communication method of claim 54, wherein the frequency offset parameter is associated with a time stamp or a time-domain step.
56. The wireless communication method of any of claims 30 to 55, wherein the first DL RS or a parameter state comprising the first DL RS is associated with a time stamp or a time-domain step.
57. The wireless communication method of claim 55 or 56, wherein the time stamp or the time-domain step is configured by an RRC signaling or a MAC-CE command.
58. The wireless communication method of any of claims 35 to 57, wherein the parameter state is a quasi-co-location, QCL, state, a transmission configuration indicator, TCI, state, spatial relation information, a RS, a reference RS, a physical random access channel, PRACH, a spatial filter or a pre-coding.
59. A wireless communication method for use in a wireless terminal, the wireless communication method comprising:
receiving a downlink, DL, signal,
wherein the DL signal is associated with at least one fourth parameter state, and
wherein at least one of the at least one fourth parameter state comprises at least one
second DL reference signal, RS, with regard to a first quasi-co-location, QCL,
type parameter.
60. The wireless communication method of claim 59, wherein the first QCL type parameter comprises a Doppler shift.

61. The wireless communication method of claim 59 or 60, wherein a frequency offset parameter between the DL signal and the at least one second DL RS is configured by an RRC signaling or a MAC-CE command.
62. The wireless communication method of any of claims 59 to 61, wherein at least one third DL RS, which is in the at least one fourth parameter state and is not associated with a UL signal, is ignored with regard to the first QCL type parameter.
63. The wireless communication method of any of claims 59 to 62, wherein the second DL RS is associated with the UL signal.
64. The wireless communication method of any of claims 59 to 63, wherein the first QCL type parameter is QCL-TYPEA, QCL-TYPEB or QCL-TYPEC.
65. The wireless communication method of claim 59, wherein one of the at least one fourth parameter state further comprises a third DL RS with regard to a second QCL type parameter, wherein the second QCL type parameter does not comprise a Doppler shift and comprises a Doppler spread.
66. The wireless communication method of claim 65, wherein the second QCL type parameter further comprises at least one of an average delay or a delay spread.
67. The wireless communication method of claim 59, wherein the first QCL type parameter comprises the Doppler spread and the Doppler shift.
68. The wireless communication method of any of claims 59 to 67, wherein the second DL RS is configured with a physical cell index and a reference RS with regard to a third QCL type parameter.
69. The wireless communication method of any of claims 59 to 67, wherein the second DL

RS is configured with a fifth parameter state, and wherein the fifth parameter state comprises a physical cell index and a reference RS with regard to a third QCL type parameter.

70. The wireless communication method of any of claims 59 to 67, wherein a parameter state comprising the second DL RS is activated with a sixth parameter state which comprises a reference RS with regard to a third QCL type parameter.
71. The wireless communication method of claim 70, wherein a QCL assumption of the second DL RS is determined according to the sixth parameter state, or the sixth parameter state is applied to the second DL RS.
72. The wireless communication method of claim 70, wherein the parameter state comprising the second DL RS is activated for a physical DL control channel, PDCCH, a physical DL shared channel, PDSCH, a physical UL control channel, PUCCH, or a physical UL shared channel, PUSCH.
73. The wireless communication method of any of claims 70 to 72, wherein the parameter state comprising the second DL RS is determined based on at least one of:
a hybrid automatic repeat request acknowledge, HARQ-Ack, message corresponding a PDSCH carrying a MAC-CE command which activates the parameter state comprising the second DL RS,
a RS transmission occasion, or
DL control information triggering the transmission of the second DL RS.
74. The wireless communication method of any of claims 68 to 73, wherein the third QCL type parameter comprises a Doppler shift.
75. The wireless communication method of any of claims 68 to 73, wherein the reference RS is a synchronization signal block, SSB.

76. The wireless communication method of any of claims 59 to 75, wherein a frequency offset parameter is configured or activated for the DL signal, for the second DL RS or for a parameter state comprising the second DL RS, and wherein the DL signal is further received according to the frequency offset parameter.
77. The wireless communication method of claim 76, wherein the frequency offset parameter is associated with a time stamp or a time-domain step.
78. The wireless communication method of any of claims 59 to 77, wherein one of the at least one fourth parameter state is associated with a time stamp or a time-domain step.
79. The wireless communication method of claim 77 or 78, wherein the time stamp or the time-domain step can be configured by an RRC signaling or a MAC-CE command.
80. The wireless communication method of any of claims 59 to 79, wherein the parameter state is a quasi-co-location, QCL, state, a transmission configuration indicator, TCI, state, spatial relation information, a RS, a reference RS, a physical random access channel, PRACH, a spatial filter or a pre-coding.
81. A wireless communication method for use in a wireless network node, the wireless communication method comprising:
transmitting, to a wireless terminal, a downlink, DL, signal,
wherein the DL signal is associated with at least one fourth parameter state, and
wherein at least one of the at least one fourth parameter state comprises at least one second DL reference signal, RS, with regard to a first quasi-co-location, QCL, type parameter.
82. The wireless communication method of claim 81, wherein the first QCL type parameter comprises a Doppler shift.

83. The wireless communication method of claim 81 or 82, wherein a frequency offset parameter between the DL signal and the at least one second DL RS is configured by an RRC signaling or a MAC-CE command.
84. The wireless communication method of any of claims 81 to 83, wherein at least one third DL RS, which is in the at least one fourth parameter state and is not associated with a UL signal, is ignored with regard to the first QCL type parameter.
85. The wireless communication method of any of claims 81 to 84, wherein the second DL RS is associated with the UL signal.
86. The wireless communication method of any of claims 81 to 84, wherein the first QCL type parameter is QCL-TYPEA, QCL-TYPEB or QCL-TYPEC.
87. The wireless communication method of claim 81, wherein one of the at least one fourth parameter state further comprises a third DL RS with regard to a second QCL type parameter, wherein the second QCL type parameter does not comprise a Doppler shift and comprises a Doppler spread.
88. The wireless communication method of claim 87, wherein the second QCL type parameter further comprises at least one of an average delay or a delay spread.
89. The wireless communication method of claim 81, wherein the first QCL type parameter comprises the Doppler spread and the Doppler shift.
90. The wireless communication method of any of claims 81 to 89, wherein the second DL RS is configured with a physical cell index and a reference RS with regard to a third QCL type parameter.

91. The wireless communication method of any of claims 81 to 89, wherein the second DL RS is configured with a fifth parameter state, and wherein the fifth parameter state comprises a physical cell index and a reference RS with regard to a third QCL type parameter.
92. The wireless communication method of any of claims 81 to 89, wherein a parameter state comprising the second DL RS is activated with a sixth parameter state which comprises a reference RS with regard to a third QCL type parameter.
93. The wireless communication method of claim 92, wherein a QCL assumption of the second DL RS is determined according to the sixth parameter state, or the sixth parameter state is applied to the second DL RS.
94. The wireless communication method of claim 92, wherein the parameter state comprising the second DL RS is activated for a physical DL control channel, PDCCH, a physical DL shared channel, PDSCH, a physical UL control channel, PUCCH, or a physical UL shared channel, PUSCH.
95. The wireless communication method of any of claims 92 to 94, wherein the parameter state comprising the second DL RS is determined based on at least one of:
 - a hybrid automatic repeat request acknowledge, HARQ-Ack, message corresponding a PDSCH carrying a MAC-CE command which activates the parameter state comprising the second DL RS,
 - a RS transmission occasion, or
 - DL control information triggering the transmission of the second DL RS.
96. The wireless communication method of any of claims 90 to 95, wherein the third QCL type parameter comprises a Doppler shift.
97. The wireless communication method of any of claims 90 to 95, wherein the reference

RS is a synchronization signal block, SSB.

98. The wireless communication method of any of claims 81 to 97, wherein a frequency offset parameter is configured or activated for the DL signal, for the second DL RS or for a parameter state comprising the second DL RS, and wherein the DL signal is further transmitted according to the frequency offset parameter.
99. The wireless communication method of claim 98, wherein the frequency offset parameter is associated with a time stamp or a time-domain step.
100. The wireless communication method of any of claims 81 to 99, wherein one of the at least one fourth parameter state is associated with a time stamp or a time-domain step.
101. The wireless communication method of claim 99 or 100, wherein the time stamp or the time-domain step can be configured by an RRC signaling or a MAC-CE command.
102. The wireless communication method of any of claims 81 to 101, wherein the parameter state is a quasi-co-location, QCL, state, a transmission configuration indicator, TCI, state, spatial relation information, a RS, a reference RS, a physical random access channel, PRACH, a spatial filter or a pre-coding.
103. A wireless terminal, comprising:
a communication unit, configured to:
transmit an uplink, UL, signal,
wherein, based on an event associated with a first downlink, DL, reference signal, RS,
the UL signal is modulated according to a specific carrier frequency.
104. The wireless terminal of claim 103, further comprising a processor configured to perform the wireless communication method of any of claims 2 to 29.

105. A wireless network node, comprising:
a communication unit, configured to:
transmit, to a wireless terminal, a first downlink, DL, reference signal, RS, and
receive, from the wireless terminal, an uplink, UL, signal,
wherein, based on an event associated with the first DL RS, the UL signal is modulated
according to a specific carrier frequency.
106. The wireless network node of claim 105, further comprising a processor configured to
perform the wireless communication method of any of claims 31 to 58.
107. A wireless terminal, comprising:
a communication unit, configured to:
receive a downlink, DL, signal,
wherein the DL signal is associated with at least one fourth parameter state, and
wherein at least one of the at least one fourth parameter state comprises at least one
second DL reference signal, RS, with regard to a first quasi-co-location, QCL,
type parameter.
108. The wireless terminal of claim 107, further comprising a processor configured to
perform the wireless communication method of any of claims 60 to 80.
109. A wireless network node, comprising:
a communication unit, configured to:
transmit, to a wireless terminal, a downlink, DL, signal,
wherein the DL signal is associated with at least one fourth parameter state, and
wherein at least one of the at least one fourth parameter state comprises at least one
second DL reference signal, RS, with regard to a first quasi-co-location, QCL,
type parameter.
110. The wireless network node of claim 109, further comprising a processor configured to

perform the wireless communication method of any of claims 82 to 102.

111. A computer program product comprising a computer-readable program medium code stored thereupon, the code, when executed by a processor, causing the processor to implement a method recited in any of claims 1 to 102.