

CLAIMS

What is claimed is:

- 1 1. A method for wireless communication at a user equipment (UE),
2 comprising:
3 receiving, from a first base station, a configuration for reference signal
4 transmission, the configuration comprising a set of uplink transmit power levels and a set of
5 time and frequency resources;
6 transmitting, based at least in part on the configuration, a plurality of uplink
7 reference signals at different power levels;
8 receiving from the first base station, based at least in part on transmitting the
9 plurality of uplink reference signals, an instruction to perform a handover to a second base
10 station, the instruction comprising an indication of a selected uplink reference signal of the
11 plurality of uplink reference signals and a power parameter associated with the indicated
12 uplink reference signal; and
13 performing the handover to the second base station based at least in part on the
14 instruction.
- 1 2. The method of claim 1, wherein the instruction further comprises a set
2 of parameters including the power parameter and one or more of a timing advance value or an
3 uplink grant.
- 1 3. The method of claim 1, further comprising:
2 determining an uplink transmit power for transmission to the second base
3 station based at least in part on the selected uplink reference signal and the power parameter.
- 1 4. The method of claim 3, further comprising:
2 transmitting, to the second base station, a handover complete message at the
3 uplink transmit power.
- 1 5. The method of claim 3, further comprising:
2 transmitting, to the second base station, a first random access message of a
3 random access procedure at the uplink transmit power.
- 1 6. The method of claim 5, further comprising:

2 transmitting, to the second base station, a second random access message of
3 the random access procedure at a second uplink transmit power, the second random access
4 message comprising a retransmission of the first random access message,
5 wherein the second uplink transmit power is higher than the uplink transmit
6 power.

1 7. The method of claim 1, further comprising:
2 determining, based at least in part on a measured signal quality, a
3 measurement event; and
4 transmitting, to the first base station, a measurement report based at least in
5 part on the measurement event,
6 wherein the set of uplink transmit power levels is based at least in part on the
7 measurement report.

1 8. The method of claim 1, wherein the power parameter comprises a
2 power correction value.

1 9. The method of claim 1, wherein the instruction further comprises one
2 or more of a timing advance value or an uplink grant.

1 10. The method of claim 1, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 11. A method for wireless communication at a first base station,
2 comprising:
3 transmitting, to a user equipment (UE), a configuration for reference signal
4 transmission, the configuration comprising a set of uplink transmit power levels and a set of
5 time and frequency resources;
6 transmitting, to a second base station, a first message comprising an indication
7 of a plurality of uplink reference signals to measure from the UE;
8 receiving, from the second base station, a second message in response to the
9 first message, the second message comprising a selected uplink reference signal of the
10 plurality of uplink reference signals and a power parameter; and

11 transmitting, to the UE, an instruction to perform a handover to the second
12 base station, the instruction comprising an indication of the selected uplink reference signal
13 and the power parameter as part of a command for the handover to the second base station.

1 12. The method of claim 11, wherein transmitting the configuration further
2 comprises:

3 receiving, from the UE, a measurement report based at least in part on a
4 measurement event; and

5 determining the set of uplink transmit power levels is based at least in part on
6 the measurement report.

1 13. The method of claim 12, further comprising:
2 identifying the second base station based at least in part on the measurement
3 report.

1 14. The method of claim 11, further comprising:
2 selecting the second base station for the handover based at least in part on the
3 receiving.

1 15. The method of claim 11, wherein the power parameter comprises a
2 power correction value.

1 16. The method of claim 11, wherein the instruction further comprises one
2 or more of a timing advance value or an uplink grant.

1 17. The method of claim 11, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 18. A method for wireless communication at a second base station,
2 comprising:
3 receiving, from a first base station, a first message comprising an indication of
4 a plurality of uplink reference signals to measure from a user equipment (UE);
5 selecting, based at least in part on the receiving, an uplink reference signal of
6 the plurality of uplink reference signals;
7 determining a power parameter based at least in part on the selecting of the
8 uplink reference signal; and

9 transmitting, to the first base station, a second message in response to the first
10 message, the second message comprising the selected uplink reference signal and the power
11 parameter.

1 19. The method of claim 18, further comprising:
2 receiving, from the first base station, a forwarding of user data for the UE
3 based at least in part on a handover of service; and
4 buffering the user data for the UE based at least in part on the receiving.

1 20. The method of claim 18, further comprising:
2 receiving, from the UE, a handover complete message based at least in part on
3 the transmitting.

1 21. The method of claim 18, further comprising:
2 receiving, from the UE, a first random access message of a random access
3 procedure based at least in part on the transmitting.

1 22. The method of claim 21, further comprising:
2 receiving, from the UE, a second random access message of the random access
3 procedure, the second random access message comprising a retransmission of the first
4 random access message at a higher uplink transmit power,
5 wherein receiving the second random access message is based at least in part
6 on an inability to decode the first random access message.

1 23. The method of claim 18, wherein the power parameter comprises a
2 power correction value.

1 24. The method of claim 18, wherein the determining further comprises:
2 determining one or more of a timing advance value or an uplink grant; and
3 transmitting the timing advance value or the uplink grant as part of the second
4 message.

1 25. The method of claim 18, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 26. An apparatus for wireless communication at a user equipment (UE),
2 comprising:
3 a first interface;
4 a second interface; and
5 a wireless modem coupled to the first interface and the second interface,
6 wherein the wireless modem is configured to:
7 obtain over the first interface a configuration from a first base station
8 for reference signal transmission, the configuration comprising a set of uplink
9 transmit power levels and a set of time and frequency resources;
10 output, based at least in part on the configuration, a plurality of uplink
11 reference signals over the second interface for transmission at different power levels;
12 obtain over the first interface, based at least in part on the plurality of
13 uplink reference signals, an instruction from the first base station to perform a
14 handover to a second base station, the instruction comprising an indication of a
15 selected uplink reference signal of the plurality of uplink reference signals and a
16 power parameter associated with the indicated uplink reference signal; and
17 perform the handover to the second base station based at least in part
18 on the instruction.

1 27. The apparatus of claim 26, wherein the instruction further comprises a
2 set of parameters including the power parameter and one or more of a timing advance value
3 or an uplink grant.

1 28. The apparatus of claim 26, wherein the wireless modem is further
2 configured to:
3 determine an uplink transmit power for transmission to the second base station
4 based at least in part on the selected uplink reference signal and the power parameter.

1 29. The apparatus of claim 28, wherein the wireless modem is further
2 configured to:
3 output, to the second base station, a handover complete message at the uplink
4 transmit power.

1 30. The apparatus of claim 28, wherein the wireless modem is further
2 configured to:
3 output, to the second base station, a first random access message of a random
4 access procedure at the uplink transmit power.

1 31. The apparatus of claim 30, wherein the wireless modem is further
2 configured to:
3 output, to the second base station, a second random access message of the
4 random access procedure at a second uplink transmit power, the second random access
5 message comprising a retransmission of the first random access message,
6 wherein the second uplink transmit power is higher than the uplink transmit
7 power.

1 32. The apparatus of claim 26, wherein the wireless modem is further
2 configured to:
3 determine, based at least in part on a measured signal quality, a measurement
4 event; and
5 output, to the first base station, a measurement report based at least in part on
6 the measurement event,
7 wherein the set of uplink transmit power levels is based at least in part on the
8 measurement report.

1 33. The apparatus of claim 26, wherein the power parameter comprises a
2 power correction value.

1 34. The apparatus of claim 26, wherein the instruction further comprises
2 one or more of a timing advance value or an uplink grant.

1 35. The apparatus of claim 26, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 36. An apparatus for wireless communication at a first base station,
2 comprising:
3 a first interface;
4 a second interface; and

5 a wireless modem coupled to the first interface and the second interface,
6 wherein the wireless modem is configured to:
7 output, to a user equipment (UE), a configuration for reference signal
8 transmission, the configuration comprising a set of uplink transmit power levels and a
9 set of time and frequency resources;
10 output, to a second base station, a first message comprising an
11 indication of a plurality of uplink reference signals to measure from the UE;
12 obtain, from the second base station, a second message in response to
13 the first message, the second message comprising a selected uplink reference signal of
14 the plurality of uplink reference signals and a power parameter; and
15 output, to the UE, an instruction to perform a handover to the second
16 base station, the instruction comprising an indication of the selected uplink reference
17 signal and the power parameter as part of a command for the handover to the second
18 base station.

1 37. The apparatus of claim 36, wherein the wireless modem is further
2 configured to:
3 obtain, from the UE, a measurement report based at least in part on a
4 measurement event; and
5 determine the set of uplink transmit power levels is based at least in part on
6 the measurement report.

1 38. The apparatus of claim 37, wherein the wireless modem is further
2 configured to:
3 identify the second base station based at least in part on the measurement
4 report.

1 39. The apparatus of claim 36, wherein the wireless modem is further
2 configured to:
3 select the second base station for the handover based at least in part on the
4 receiving.

1 40. The apparatus of claim 36, wherein the power parameter comprises a
2 power correction value.

1 41. The apparatus of claim 36, wherein the instruction further comprises
2 one or more of a timing advance value or an uplink grant.

1 42. The apparatus of claim 36, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 43. An apparatus for wireless communication at a second base station,
2 comprising:
3 a first interface;
4 a second interface; and
5 a wireless modem coupled to the first interface and the second interface,
6 wherein the wireless modem is configured to:
7 obtain, from a first base station, a first message comprising an
8 indication of a plurality of uplink reference signals to measure from a user equipment
9 (UE);
10 select, based at least in part on the receiving, an uplink reference signal
11 of the plurality of uplink reference signals;
12 determine a power parameter based at least in part on the selecting of
13 the uplink reference signal; and
14 output, to the first base station, a second message in response to the
15 first message, the second message comprising the selected uplink reference signal and
16 the power parameter.

1 44. The apparatus of claim 43, wherein the wireless modem is further
2 configured to:
3 obtain, from the first base station, a forwarding of user data for the UE based
4 at least in part on a handover of service; and
5 buffer the user data for the UE based at least in part on the receiving.

1 45. The apparatus of claim 43, wherein the wireless modem is further
2 configured to:
3 obtain, from the UE, a handover complete message based at least in part on the
4 transmitting.

1 46. The apparatus of claim 43, wherein the wireless modem is further
2 configured to:
3 obtain, from the UE, a first random access message of a random access
4 procedure based at least in part on the transmitting.

1 47. The apparatus of claim 46, wherein the wireless modem is further
2 configured to:
3 obtain, from the UE, a second random access message of the random access
4 procedure, the second random access message comprising a retransmission of the first
5 random access message at a higher uplink transmit power,
6 wherein obtaining the second random access message is based at least in part
7 on an inability to decode the first random access message.

1 48. The apparatus of claim 43, wherein the power parameter comprises a
2 power correction value.

1 49. The apparatus of claim 43, wherein the wireless modem is further
2 configured to:
3 determine one or more of a timing advance value or an uplink grant; and
4 transmit the timing advance value or the uplink grant as part of the second
5 message.

1 50. The apparatus of claim 43, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 51. An apparatus for wireless communication at a user equipment (UE),
2 comprising:
3 means for receiving, from a first base station, a configuration for reference
4 signal transmission, the configuration comprising a set of uplink transmit power levels and a
5 set of time and frequency resources;
6 means for transmitting, based at least in part on the configuration, a plurality
7 of uplink reference signals at different power levels;
8 means for receiving from the first base station, based at least in part on
9 transmitting the plurality of uplink reference signals, an instruction to perform a handover to

10 a second base station, the instruction comprising an indication of a selected uplink reference
11 signal of the plurality of uplink reference signals and a power parameter associated with the
12 indicated uplink reference signal; and
13 means for performing the handover to the second base station based at least in
14 part on the instruction.

1 52. The apparatus of claim 51, wherein the instruction further comprises a
2 set of parameters including the power parameter and one or more of a timing advance value
3 or an uplink grant.

1 53. The apparatus of claim 51, further comprising:
2 means for determining an uplink transmit power for transmission to the second
3 base station based at least in part on the selected uplink reference signal and the power
4 parameter.

1 54. The apparatus of claim 53, further comprising:
2 means for transmitting, to the second base station, a handover complete
3 message at the uplink transmit power.

1 55. The apparatus of claim 53, further comprising:
2 means for transmitting, to the second base station, a first random access
3 message of a random access procedure at the uplink transmit power.

1 56. The apparatus of claim 55, further comprising:
2 means for transmitting, to the second base station, a second random access
3 message of the random access procedure at a second uplink transmit power, the second
4 random access message comprising a retransmission of the first random access message,
5 wherein the second uplink transmit power is higher than the uplink transmit
6 power.

1 57. The apparatus of claim 51, further comprising:
2 means for determining, based at least in part on a measured signal quality, a
3 measurement event; and
4 means for transmitting, to the first base station, a measurement report based at
5 least in part on the measurement event,

6 wherein the set of uplink transmit power levels is based at least in part on the
7 measurement report.

1 58. The apparatus of claim 51, wherein the power parameter comprises a
2 power correction value.

1 59. The apparatus of claim 51, wherein the instruction further comprises
2 one or more of a timing advance value or an uplink grant.

1 60. The apparatus of claim 51, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 61. An apparatus for wireless communication at a first base station,
2 comprising:
3 means for transmitting, to a user equipment (UE), a configuration for
4 reference signal transmission, the configuration comprising a set of uplink transmit power
5 levels and a set of time and frequency resources;
6 means for transmitting, to a second base station, a first message comprising an
7 indication of a plurality of uplink reference signals to measure from the UE;
8 means for receiving, from the second base station, a second message in
9 response to the first message, the second message comprising a selected uplink reference
10 signal of the plurality of uplink reference signals and a power parameter; and
11 means for transmitting, to the UE, an instruction to perform a handover to the
12 second base station, the instruction comprising an indication of the selected uplink reference
13 signal and the power parameter as part of a command for the handover to the second base
14 station.

1 62. The apparatus of claim 61, wherein the means for transmitting the
2 configuration further comprises:

3 means for receiving, from the UE, a measurement report based at least in part
4 on a measurement event; and

5 means for determining the set of uplink transmit power levels is based at least
6 in part on the measurement report.

1 63. The apparatus of claim 62, further comprising:

2 means for identifying the second base station based at least in part on the
3 measurement report.

1 64. The apparatus of claim 61, further comprising:
2 means for selecting the second base station for the handover based at least in
3 part on the receiving.

1 65. The apparatus of claim 61, wherein the power parameter comprises a
2 power correction value.

1 66. The apparatus of claim 61, wherein the instruction further comprises
2 one or more of a timing advance value or an uplink grant.

1 67. The apparatus of claim 61, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 68. An apparatus for wireless communication at a second base station,
2 comprising:
3 means for receiving, from a first base station, a first message comprising an
4 indication of a plurality of uplink reference signals to measure from a user equipment (UE);
5 means for selecting, based at least in part on the receiving, an uplink reference
6 signal of the plurality of uplink reference signals;
7 means for determining a power parameter based at least in part on the
8 selecting of the uplink reference signal; and
9 means for transmitting, to the first base station, a second message in response
10 to the first message, the second message comprising the selected uplink reference signal and
11 the power parameter.

1 69. The apparatus of claim 68, further comprising:
2 means for receiving, from the first base station, a forwarding of user data for
3 the UE based at least in part on a handover of service; and
4 means for buffering the user data for the UE based at least in part on the
5 receiving.

1 70. The apparatus of claim 68, further comprising:

2 means for receiving, from the UE, a handover complete message based at least
3 in part on the transmitting.

1 71. The apparatus of claim 68, further comprising:
2 means for receiving, from the UE, a first random access message of a random
3 access procedure based at least in part on the transmitting.

1 72. The apparatus of claim 71, further comprising:
2 means for receiving, from the UE, a second random access message of the
3 random access procedure, the second random access message comprising a retransmission of
4 the first random access message at a higher uplink transmit power,
5 wherein receiving the second random access message is based at least in part
6 on an inability to decode the first random access message.

1 73. The apparatus of claim 68, wherein the power parameter comprises a
2 power correction value.

1 74. The apparatus of claim 68, wherein the determining further comprises:
2 means for determining one or more of a timing advance value or an uplink
3 grant; and
4 means for transmitting the timing advance value or the uplink grant as part of
5 the second message.

1 75. The apparatus of claim 68, wherein the plurality of uplink reference
2 signals comprise sounding reference signal repetitions.

1 76. A non-transitory computer-readable medium storing code for wireless
2 communication at a user equipment (UE), the code comprising instructions executable by a
3 processor to:
4 receive, from a first base station, a configuration for reference signal
5 transmission, the configuration comprising a set of uplink transmit power levels and a set of
6 time and frequency resources;
7 transmit, based at least in part on the configuration, a plurality of uplink
8 reference signals at different power levels;

9 receive from the first base station, based at least in part on transmitting the
10 plurality of uplink reference signals, an instruction to perform a handover to a second base
11 station, the instruction comprising an indication of a selected uplink reference signal of the
12 plurality of uplink reference signals and a power parameter associated with the indicated
13 uplink reference signal; and
14 perform the handover to the second base station based at least in part on the
15 instruction.

1 77. The non-transitory computer-readable medium of claim 76, wherein
2 the instruction further comprises a set of parameters including the power parameter and one
3 or more of a timing advance value or an uplink grant.

1 78. The non-transitory computer-readable medium of claim 76, wherein
2 the instructions are further executable to:
3 determine an uplink transmit power for transmission to the second base station
4 based at least in part on the selected uplink reference signal and the power parameter.

1 79. The non-transitory computer-readable medium of claim 78, wherein
2 the instructions are further executable to:
3 transmit, to the second base station, a handover complete message at the
4 uplink transmit power.

1 80. The non-transitory computer-readable medium of claim 78, wherein
2 the instructions are further executable to:
3 transmit, to the second base station, a first random access message of a
4 random access procedure at the uplink transmit power.

1 81. The non-transitory computer-readable medium of claim 80, wherein
2 the instructions are further executable to:
3 transmit, to the second base station, a second random access message of the
4 random access procedure at a second uplink transmit power, the second random access
5 message comprising a retransmission of the first random access message,
6 wherein the second uplink transmit power is higher than the uplink transmit
7 power.

1 82. The non-transitory computer-readable medium of claim 76, wherein
2 the instructions are further executable to:
3 determine, based at least in part on a measured signal quality, a measurement
4 event; and
5 transmit, to the first base station, a measurement report based at least in part
6 on the measurement event,
7 wherein the set of uplink transmit power levels is based at least in part on the
8 measurement report.

1 83. The non-transitory computer-readable medium of claim 76, wherein
2 the power parameter comprises a power correction value.

1 84. The non-transitory computer-readable medium of claim 76, wherein
2 the instruction further comprises one or more of a timing advance value or an uplink grant.

1 85. The non-transitory computer-readable medium of claim 76, wherein
2 the plurality of uplink reference signals comprise sounding reference signal repetitions.

1 86. A non-transitory computer-readable medium storing code for wireless
2 communication at a first base station, the code comprising instructions executable by a
3 processor to:
4 transmit, to a user equipment (UE), a configuration for reference signal
5 transmission, the configuration comprising a set of uplink transmit power levels and a set of
6 time and frequency resources;
7 transmit, to a second base station, a first message comprising an indication of
8 a plurality of uplink reference signals to measure from the UE;
9 receive, from the second base station, a second message in response to the first
10 message, the second message comprising a selected uplink reference signal of the plurality of
11 uplink reference signals and a power parameter; and
12 transmit, to the UE, an instruction to perform a handover to the second base
13 station, the instruction comprising an indication of the selected uplink reference signal and
14 the power parameter as part of a command for the handover to the second base station.

1 87. The non-transitory computer-readable medium of claim 86, wherein
2 the instructions to transmit the configuration are further executable to:
3 receive, from the UE, a measurement report based at least in part on a
4 measurement event; and
5 determine the set of uplink transmit power levels is based at least in part on
6 the measurement report.

1 88. The non-transitory computer-readable medium of claim 87, wherein
2 the instructions are further executable to:
3 identify the second base station based at least in part on the measurement
4 report.

1 89. The non-transitory computer-readable medium of claim 86, wherein
2 the instructions are further executable to:
3 select the second base station for the handover based at least in part on the
4 receiving.

1 90. The non-transitory computer-readable medium of claim 86, wherein
2 the power parameter comprises a power correction value.

1 91. The non-transitory computer-readable medium of claim 86, wherein
2 the instruction further comprises one or more of a timing advance value or an uplink grant.

1 92. The non-transitory computer-readable medium of claim 86, wherein
2 the plurality of uplink reference signals comprise sounding reference signal repetitions.

1 93. A non-transitory computer-readable medium storing code for wireless
2 communication at a second base station, the code comprising instructions executable by a
3 processor to:
4 receive, from a first base station, a first message comprising an indication of a
5 plurality of uplink reference signals to measure from a user equipment (UE);
6 select, based at least in part on the receiving, an uplink reference signal of the
7 plurality of uplink reference signals;
8 determine a power parameter based at least in part on the selecting of the
9 uplink reference signal; and

10 transmit, to the first base station, a second message in response to the first
11 message, the second message comprising the selected uplink reference signal and the power
12 parameter.

1 94. The non-transitory computer-readable medium of claim 93, wherein
2 the instructions are further executable to:
3 receive, from the first base station, a forwarding of user data for the UE based
4 at least in part on a handover of service; and
5 buffer the user data for the UE based at least in part on the receiving.

1 95. The non-transitory computer-readable medium of claim 93, wherein
2 the instructions are further executable to:
3 receive, from the UE, a handover complete message based at least in part on
4 the transmitting.

1 96. The non-transitory computer-readable medium of claim 93, wherein
2 the instructions are further executable to:
3 receive, from the UE, a first random access message of a random access
4 procedure based at least in part on the transmitting.

1 97. The non-transitory computer-readable medium of claim 96, wherein
2 the instructions are further executable to:
3 receive, from the UE, a second random access message of the random access
4 procedure, the second random access message comprising a retransmission of the first
5 random access message at a higher uplink transmit power,
6 wherein receiving the second random access message is based at least in part
7 on an inability to decode the first random access message.

1 98. The non-transitory computer-readable medium of claim 93, wherein
2 the power parameter comprises a power correction value.

1 99. The non-transitory computer-readable medium of claim 93, wherein
2 the instructions to determine the power parameter are executable to:
3 determine one or more of a timing advance value or an uplink grant; and

4 transmit the timing advance value or the uplink grant as part of the second
5 message.

1 100. The non-transitory computer-readable medium of claim 93, wherein
2 the plurality of uplink reference signals comprise sounding reference signal repetitions.