

## CLAIMS

**What is claimed is:**

1. A method for wireless communication, comprising:  
receiving, from a base station, configuration information that configures a first set of uplink resources and a second set of uplink resources within a shared radio frequency spectrum band for transmission of one or more uplink transmissions to the base station, the first set of uplink resources being adjacent in time to the second set of uplink resources;  
selecting the first set of uplink resources or the second set of uplink resources for an uplink control channel transmission to the base station based at least in part on one or more downlink transmissions from the base station; and  
transmitting the one or more uplink transmissions to the base station using the selected first set of uplink resources or second set of uplink resources.
2. The method of claim 1, wherein each of the first set of uplink resources and the second set of uplink resources have associated uplink control channel resources.
3. The method of claim 2, wherein the selection of the first set of uplink resources or the second set of uplink resources is based at least in part on a location in time of the uplink control channel resources associated with the first set of uplink resources and a location in time of the uplink control channel resources associated with the second set of uplink resources relative to a time boundary of an uplink transmission duration.
4. The method of claim 1, wherein the selecting comprises:  
identifying that one or more downlink transmissions from the base station are transmitted using downlink resources associated with the first set of uplink resources; and  
selecting the first set of uplink resources for the one or more uplink transmissions based at least in part on the identifying.
5. The method of claim 1, wherein the selecting comprises:  
receiving signaling in one or more downlink transmissions that indicates which of the first set of uplink resources or the second set of uplink resources is to be used for the one or more uplink transmissions.

6. The method of claim 1, wherein the one or more uplink transmissions are transmitted within a radio frame having one or more uplink portions and one or more downlink portions, and wherein each uplink portion is partitioned into the first set of uplink resources and the second set of uplink resources.

7. The method of claim 1, wherein each of the first set of uplink resources and the second set of uplink resources have uplink control channel resources, and wherein the uplink control channel resources are independently configured for each of the first set of uplink resources and the second set of uplink resources.

8. The method of claim 1, wherein the transmitting comprises:  
transmitting using the selected first set of uplink resources or second set of uplink resources for each of one or more downlink-uplink parts of a radio frame based at least in part on an uplink grant received from the base station.

9. The method of claim 8, wherein the uplink grant received from the base station dynamically indicates which of the first set of uplink resources or the second set of uplink resources are to be used for each downlink-uplink part of the radio frame.

10. The method of claim 1, wherein the uplink control channel transmission to the base station includes uplink control information (UCI) comprising one or more of acknowledgement feedback that acknowledges receipt of one or more downlink transmissions or channel state information (CSI) that indicates one or more measured parameters of a channel.

11. The method of claim 1, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are dropped when the first subframe includes an uplink control channel transmission.

12. The method of claim 1, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are rate-

matched around an uplink control channel transmission resource when the first subframe includes an uplink control channel transmission.

13. The method of claim 12, wherein the uplink shared channel transmissions within the first subframe are rate-matched around the uplink control channel transmission resource and one or more other uplink control channel transmission resources of one or more other transmitters.

14. The method of claim 1, wherein the one or more uplink transmissions include a sounding reference signal (SRS) transmission, and wherein the SRS is transmitted in the selected set of uplink resources when a configured SRS location is within the selected set of uplink resources, and wherein a scheduled SRS transmission is dropped when the configured SRS location is in a different set of uplink resources than the selected set of uplink resources, and wherein the SRS transmission is transmitted in any selected set of uplink resources when the SRS location is not configured.

15. A method for wireless communication, comprising:  
configuring, at a base station, a first set of uplink resources and a second set of uplink resources within a shared radio frequency spectrum band for uplink transmissions of at least one user equipment (UE), the first set of uplink resources being adjacent in time to the second set of uplink resources and each of the first set of uplink resources and the second set of uplink resources having associated uplink control channel resources;  
selecting the first set of uplink resources or the second set of uplink resources for one or more uplink transmissions of a first UE based at least in part on a location in time of the control channel resources associated with the first set of uplink resources and a location in time of the control channel resources associated with the second set of uplink resources relative to a time boundary of an uplink transmission duration of the first UE; and  
transmitting an indication to the first UE that indicates which of the first set of uplink resources or the second set of uplink resources are to be used for the one or more uplink transmissions.

16. The method of claim 15, further comprising:  
transmitting one or more downlink transmissions to the first UE using a first set of downlink resources, and wherein the first set of downlink resources used for the one or

more downlink transmissions indicates to the UE that the first set of uplink resources are to be used for the one or more uplink transmissions.

17. The method of claim 15, wherein the transmitting the indication to the first UE comprises:

transmitting signaling in one or more downlink transmissions that indicates which of the first set of uplink resources or the second set of uplink resources is to be used for the one or more uplink transmissions.

18. The method of claim 15, wherein the one or more uplink transmissions are transmitted within a radio frame having one or more uplink portions and one or more downlink portions, and wherein each uplink portion is partitioned into the first set of uplink resources and the second set of uplink resources.

19. The method of claim 15, wherein each of the first set of uplink resources and the second set of uplink resources have uplink control channel resources, and wherein the uplink control channel resources are independently configured for each of the first set of uplink resources and the second set of uplink resources.

20. The method of claim 15, wherein the configuring comprises:  
configuring the first set of uplink resources and the second set of uplink resources for each of one or more downlink-uplink parts of a radio frame.

21. The method of claim 20, wherein the transmitting the indication to the first UE comprises:

transmitting one or more uplink grants to the first UE that dynamically indicate which of the first set of uplink resources or the second set of uplink resources are to be used for each downlink-uplink part of the radio frame.

22. The method of claim 15, further comprising:

receiving an uplink control channel transmission from the first UE that includes uplink control information (UCI) comprising one or more of acknowledgement feedback that acknowledges receipt of one or more downlink transmissions or channel state information (CSI) that indicates one or more measured parameters of a channel.

23. The method of claim 15, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are dropped when the first subframe includes an uplink control channel transmission.

24. The method of claim 15, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are rate-matched around an uplink control channel transmission resource when the first subframe includes an uplink control channel transmission.

25. The method of claim 24, wherein the uplink shared channel transmissions within the first subframe are rate-matched around the uplink control channel transmission resource and one or more other uplink control channel transmission resources of one or more other transmitters.

26. A method for wireless communication, comprising:  
receiving, at a user equipment (UE) from a base station, configuration information that configures uplink shared channel resources and uplink control channel resources for one or more uplink transmissions from the UE to the base station;  
identifying uplink control information (UCI) to be transmitted to the base station;  
determining that the uplink shared channel resources include sufficient resources for transmission of the UCI to the base station; and  
transmitting the UCI to the base station using the uplink shared channel resources responsive to the determining.

27. The method of claim 26, further comprising:  
transmitting the UCI to the base station using the uplink control channel resources responsive to determining that the uplink shared channel resources include insufficient resources for transmission of the UCI to the base station.

28. The method of claim 27, further comprising:

receiving a downlink control information (DCI) transmission from the base station, the DCI transmission including an indication of whether the uplink shared channel resources can be used to transmit the UCI, and wherein the determining is performed responsive to receiving a DCI indication that the uplink shared channel resources can be used to transmit the UCI.

29. The method of claim 26, wherein the UCI includes acknowledgement feedback that acknowledges receipt of one or more downlink transmissions that is transmitted in a first valid subframe of a radio frame after one or more downlink transmissions received from the base station, channel state information (CSI) that indicates one or more measured parameters of a channel that is transmitted in any available subframe of the radio frame when the CSI is available and the UE is configured to report CSI in the radio frame, or any combination thereof.

30. The method of claim 26, wherein the uplink shared channel resources do not overlap with the uplink control channel resources, and wherein the configuration information further configures the UCI to be transmitted using the uplink control channel resources independently of other uplink transmissions using the uplink shared channel resources, or the configuration information further configures the UCI to be transmitted using the uplink shared channel resources responsive to the determining.

31. The method of claim 26, further comprising:  
identifying a mapping between a first number of subframes of a radio frame that include the uplink control channel resources and a second number of configured uplink shared channel repetitions, and wherein the determining is based at least in part on the mapping.

32. The method of claim 31, wherein the determining comprises:  
determining to use the uplink shared channel resources for transmission of the UCI when the second number of configured uplink shared channel repetitions is greater than or equal to the first number of subframes.

33. The method of claim 32, wherein the determining further comprises:  
determining to use the uplink control channel resources for transmission of the UCI when the second number of configured uplink shared channel repetitions is less than the first number of subframes.

34. The method of claim 26, further comprising:

transmitting one or more uplink shared channel transmissions to the base station using the uplink shared channel resources, wherein the one or more uplink shared channel transmissions are multiplexed with the UCI.

35. A method for wireless communication, comprising:

configuring, at a base station, a user equipment (UE) with uplink shared channel resources and uplink control channel resources for one or more uplink transmissions from the UE to the base station;

configuring the UE to determine whether the uplink shared channel resources include sufficient resources for transmission of uplink control information (UCI) to be transmitted to the base station; and

receiving the UCI from the UE via the uplink shared channel resources when the uplink shared channel resources include sufficient resources for transmission of the UCI.

36. The method of claim 35, further comprising:

receiving the UCI from the UE via the uplink control channel resources when the uplink shared channel resources include insufficient resources for transmission of the UCI.

37. The method of claim 36, further comprising:

transmitting a downlink control information (DCI) transmission to the UE, the DCI transmission including an indication of whether the uplink shared channel resources can be used to transmit the UCI.

38. The method of claim 35, wherein the UCI includes acknowledgement

feedback that acknowledges receipt of one or more downlink transmissions, the acknowledgement feedback transmitted in a first valid subframe of a radio frame after the one or more downlink transmissions, channel state information (CSI) that indicates one or more measured parameters of a channel, the CSI transmitted in any available subframe of the radio frame when the CSI is available and the UE is configured to report CSI in the radio frame, or any combination thereof.

39. The method of claim 35, wherein the uplink shared channel resources

do not overlap with the uplink control channel resources, and wherein the UE is further

configured to transmit the UCI using the uplink control channel resources independently of other uplink transmissions using the uplink shared channel resources, or to transmit the UCI using the uplink shared channel resources when the uplink shared channel resources include sufficient resources for transmission of the UCI.

40. The method of claim 35, further comprising:

identifying a mapping between a first number of subframes of a radio frame that include the uplink control channel resources and a second number of configured uplink shared channel repetitions, and wherein a determination that the uplink shared channel resources include sufficient resources for transmission of the UCI is based at least in part on the mapping.

41. The method of claim 40, wherein the configuring the UE to determine whether the uplink shared channel resources include sufficient resources comprises:

configuring the UE to determine that the uplink shared channel resources are used for transmission of the UCI when the second number of configured uplink shared channel repetitions is greater than or equal to the first number of subframes.

42. The method of claim 41, wherein the configuring the UE to determine whether the uplink shared channel resources include sufficient resources comprises:

configuring the UE to determine that the uplink control channel resources are used for transmission of the UCI when the second number of configured uplink shared channel repetitions is less than the first number of subframes.

43. The method of claim 35, further comprising:

receiving one or more uplink shared channel transmissions from the UE using the uplink shared channel resources, wherein the one or more uplink shared channel transmissions are multiplexed with the UCI.

44. An apparatus for wireless communication, comprising:

means for receiving, from a base station, configuration information that configures a first set of uplink resources and a second set of uplink resources within a shared radio frequency spectrum band for transmission of one or more uplink transmissions to the base station, the first set of uplink resources being adjacent in time to the second set of uplink resources;

means for selecting the first set of uplink resources or the second set of uplink resources for an uplink control channel transmission to the base station based at least in part on one or more downlink transmissions from the base station; and

means for transmitting the one or more uplink transmissions to the base station using the selected first set of uplink resources or second set of uplink resources.

45. The apparatus of claim 44, wherein each of the first set of uplink resources and the second set of uplink resources have associated uplink control channel resources.

46. The apparatus of claim 45, wherein the selection of the first set of uplink resources or the second set of uplink resources is based at least in part on a location in time of the uplink control channel resources associated with the first set of uplink resources and a location in time of the uplink control channel resources associated with the second set of uplink resources relative to a time boundary of an uplink transmission duration.

47. The apparatus of claim 44, wherein the means for selecting the first set of uplink resources or the second set of uplink resources further comprises:

means for identifying that one or more downlink transmissions from the base station are transmitted using downlink resources associated with the first set of uplink resources; and

means for selecting the first set of uplink resources for the one or more uplink transmissions based at least in part on the identifying.

48. The apparatus of claim 44, wherein the means for selecting the first set of uplink resources or the second set of uplink resources further comprises:

means for receiving signaling in one or more downlink transmissions that indicates which of the first set of uplink resources or the second set of uplink resources is to be used for the one or more uplink transmissions.

49. The apparatus of claim 44, wherein the one or more uplink transmissions are transmitted within a radio frame having one or more uplink portions and one or more downlink portions, and wherein each uplink portion is partitioned into the first set of uplink resources and the second set of uplink resources.

50. The apparatus of claim 44, wherein each of the first set of uplink resources and the second set of uplink resources have uplink control channel resources, and wherein the uplink control channel resources are independently configured for each of the first set of uplink resources and the second set of uplink resources.

51. The apparatus of claim 44, wherein the means for transmitting the one or more uplink transmissions further comprises:

means for transmitting using the selected first set of uplink resources or second set of uplink resources for each of one or more downlink-uplink parts of a radio frame based at least in part on an uplink grant received from the base station.

52. The apparatus of claim 51, wherein the uplink grant received from the base station dynamically indicates which of the first set of uplink resources or the second set of uplink resources are to be used for each downlink-uplink part of the radio frame.

53. The apparatus of claim 44, wherein the uplink control channel transmission to the base station includes uplink control information (UCI) comprising one or more of acknowledgement feedback that acknowledges receipt of one or more downlink transmissions or channel state information (CSI) that indicates one or more measured parameters of a channel.

54. The apparatus of claim 44, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are dropped when the first subframe includes an uplink control channel transmission.

55. The apparatus of claim 44, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are rate-matched around an uplink control channel transmission resource when the first subframe includes an uplink control channel transmission.

56. The apparatus of claim 55, wherein the uplink shared channel transmissions within the first subframe are rate-matched around the uplink control channel transmission resource and one or more other uplink control channel transmission resources of one or more other transmitters.

57. The apparatus of claim 44, wherein the one or more uplink transmissions include a sounding reference signal (SRS) transmission, and wherein the SRS is transmitted in the selected set of uplink resources when a configured SRS location is within the selected set of uplink resources, and wherein a scheduled SRS transmission is dropped when the configured SRS location is in a different set of uplink resources than the selected set of uplink resources, and wherein the SRS transmission is transmitted in any selected set of uplink resources when the SRS location is not configured.

58. An apparatus for wireless communication, comprising:  
means for configuring, at a base station, a first set of uplink resources and a second set of uplink resources within a shared radio frequency spectrum band for uplink transmissions of at least one user equipment (UE), the first set of uplink resources being adjacent in time to the second set of uplink resources and each of the first set of uplink resources and the second set of uplink resources having associated uplink control channel resources;  
means for selecting the first set of uplink resources or the second set of uplink resources for one or more uplink transmissions of a first UE based at least in part on a location in time of the control channel resources associated with the first set of uplink resources and a location in time of the control channel resources associated with the second set of uplink resources relative to a time boundary of an uplink transmission duration of the first UE; and  
means for transmitting an indication to the first UE that indicates which of the first set of uplink resources or the second set of uplink resources are to be used for the one or more uplink transmissions.

59. The apparatus of claim 58, further comprising:  
means for transmitting one or more downlink transmissions to the first UE using a first set of downlink resources, and wherein the first set of downlink resources used

for the one or more downlink transmissions indicates to the UE that the first set of uplink resources are to be used for the one or more uplink transmissions.

60. The apparatus of claim 58, wherein the means for transmitting the indication to the first UE further comprises:

means for transmitting signaling in one or more downlink transmissions that indicates which of the first set of uplink resources or the second set of uplink resources is to be used for the one or more uplink transmissions.

61. The apparatus of claim 58, wherein the one or more uplink transmissions are transmitted within a radio frame having one or more uplink portions and one or more downlink portions, and wherein each uplink portion is partitioned into the first set of uplink resources and the second set of uplink resources.

62. The apparatus of claim 58, wherein each of the first set of uplink resources and the second set of uplink resources have uplink control channel resources, and wherein the uplink control channel resources are independently configured for each of the first set of uplink resources and the second set of uplink resources.

63. The apparatus of claim 58, wherein the means for configuring the first set of uplink resources further comprises:

means for configuring the first set of uplink resources and the second set of uplink resources for each of one or more downlink-uplink parts of a radio frame.

64. The apparatus of claim 63, wherein the means for transmitting the indication to the first UE further comprises:

means for transmitting one or more uplink grants to the first UE that dynamically indicate which of the first set of uplink resources or the second set of uplink resources are to be used for each downlink-uplink part of the radio frame.

65. The apparatus of claim 58, further comprising:

means for receiving an uplink control channel transmission from the first UE that includes uplink control information (UCI) comprising one or more of acknowledgement feedback that acknowledges receipt of one or more downlink transmissions or channel state information (CSI) that indicates one or more measured parameters of a channel.

66. The apparatus of claim 58, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are dropped when the first subframe includes an uplink control channel transmission.

67. The apparatus of claim 58, wherein the one or more uplink transmissions include one or more uplink shared channel transmissions and one or more uplink control channel transmissions that are transmitted within one or more uplink subframes of a radio frame, and wherein uplink shared channel transmissions within a first subframe are rate-matched around an uplink control channel transmission resource when the first subframe includes an uplink control channel transmission.

68. The apparatus of claim 67, wherein the uplink shared channel transmissions within the first subframe are rate-matched around the uplink control channel transmission resource and one or more other uplink control channel transmission resources of one or more other transmitters.

69. An apparatus for wireless communication, comprising:  
means for receiving, at a user equipment (UE) from a base station, configuration information that configures uplink shared channel resources and uplink control channel resources for one or more uplink transmissions from the UE to the base station;  
means for identifying uplink control information (UCI) to be transmitted to the base station;  
means for determining that the uplink shared channel resources include sufficient resources for transmission of the UCI to the base station; and  
means for transmitting the UCI to the base station using the uplink shared channel resources responsive to the determining.

70. The apparatus of claim 69, further comprising:  
means for transmitting the UCI to the base station using the uplink control channel resources responsive to determining that the uplink shared channel resources include insufficient resources for transmission of the UCI to the base station.

71. The apparatus of claim 70, further comprising:

means for receiving a downlink control information (DCI) transmission from the base station, the DCI transmission including an indication of whether the uplink shared channel resources can be used to transmit the UCI, and wherein the means for determining is performed responsive to receiving a DCI indication that the uplink shared channel resources can be used to transmit the UCI.

72. The apparatus of claim 69, wherein the UCI includes

acknowledgement feedback that acknowledges receipt of one or more downlink transmissions that is transmitted in a first valid subframe of a radio frame after one or more downlink transmissions received from the base station, channel state information (CSI) that indicates one or more measured parameters of a channel that is transmitted in any available subframe of the radio frame when the CSI is available and the UE is configured to report CSI in the radio frame, or any combination thereof.

73. The apparatus of claim 69, wherein the uplink shared channel

resources do not overlap with the uplink control channel resources, and wherein the configuration information further configures the UCI to be transmitted using the uplink control channel resources independently of other uplink transmissions using the uplink shared channel resources, or the configuration information further configures the UCI to be transmitted using the uplink shared channel resources responsive to the determining.

74. The apparatus of claim 69, further comprising:

means for identifying a mapping between a first number of subframes of a radio frame that include the uplink control channel resources and a second number of configured uplink shared channel repetitions, and wherein the determining is based at least in part on the mapping.

75. The apparatus of claim 74, wherein the means for determining that the uplink shared channel resources include sufficient resources further comprises:

means for determining to use the uplink shared channel resources for transmission of the UCI when the second number of configured uplink shared channel repetitions is greater than or equal to the first number of subframes.

76. The apparatus of claim 75, wherein the means for determining that the uplink shared channel resources include sufficient resources further comprises:

means for determining to use the uplink control channel resources for transmission of the UCI when the second number of configured uplink shared channel repetitions is less than the first number of subframes.

77. The apparatus of claim 69, further comprising:

means for transmitting one or more uplink shared channel transmissions to the base station using the uplink shared channel resources, wherein the one or more uplink shared channel transmissions are multiplexed with the UCI.

78. An apparatus for wireless communication, comprising:

means for configuring, at a base station, a user equipment (UE) with uplink shared channel resources and uplink control channel resources for one or more uplink transmissions from the UE to the base station;

means for configuring the UE to determine whether the uplink shared channel resources include sufficient resources for transmission of uplink control information (UCI) to be transmitted to the base station; and

means for receiving the UCI from the UE via the uplink shared channel resources when the uplink shared channel resources include sufficient resources for transmission of the UCI.

79. The apparatus of claim 78, further comprising:

means for receiving the UCI from the UE via the uplink control channel resources when the uplink shared channel resources include insufficient resources for transmission of the UCI.

80. The apparatus of claim 79, further comprising:

means for transmitting a downlink control information (DCI) transmission to the UE, the DCI transmission including an indication of whether the uplink shared channel resources can be used to transmit the UCI.

81. The apparatus of claim 78, wherein the UCI includes acknowledgement feedback that acknowledges receipt of one or more downlink transmissions, the acknowledgement feedback transmitted in a first valid subframe of a radio

frame after the one or more downlink transmissions, channel state information (CSI) that indicates one or more measured parameters of a channel, the CSI transmitted in any available subframe of the radio frame when the CSI is available and the UE is configured to report CSI in the radio frame, or any combination thereof.

82. The apparatus of claim 78, wherein the uplink shared channel resources do not overlap with the uplink control channel resources, and wherein the UE is further configured to transmit the UCI using the uplink control channel resources independently of other uplink transmissions using the uplink shared channel resources, or to transmit the UCI using the uplink shared channel resources when the uplink shared channel resources include sufficient resources for transmission of the UCI.

83. The apparatus of claim 78, further comprising:  
means for identifying a mapping between a first number of subframes of a radio frame that include the uplink control channel resources and a second number of configured uplink shared channel repetitions, and wherein a determination that the uplink shared channel resources include sufficient resources for transmission of the UCI is based at least in part on the mapping.

84. The apparatus of claim 83, wherein the means for configuring the UE to determine whether the uplink shared channel resources further comprises:

means for determining that the uplink shared channel resources are used for transmission of the UCI when the second number of configured uplink shared channel repetitions is greater than or equal to the first number of subframes.

85. The apparatus of claim 84, wherein the means for configuring the UE to determine whether the uplink shared channel resources further comprises:

means for determining that the uplink control channel resources are used for transmission of the UCI when the second number of configured uplink shared channel repetitions is less than the first number of subframes.

86. The apparatus of claim 78, further comprising:

means for receiving one or more uplink shared channel transmissions from the UE using the uplink shared channel resources, wherein the one or more uplink shared channel transmissions are multiplexed with the UCI.