

CLAIMS

1. A method for wireless communication, comprising: identifying an available bandwidth of a frequency spectrum; identifying a minimum occupancy of the available bandwidth; obtaining a data stream comprising data to be transmitted on one or more uplink channels, each of the one or more uplink channels comprising a number of allocated interlaces for an uplink transmission over the frequency spectrum, wherein each of the number of allocated interlaces comprises one or more resource blocks of the frequency spectrum, and wherein the one or more resource blocks of the number of allocated interlaces spans at least the minimum occupancy of the available bandwidth; demultiplexing the data stream to provide one or more demultiplexed data streams for the number of allocated interlaces; and mapping at least one of the one or more demultiplexed data streams onto a plurality of resource elements associated with the number of allocated interlaces.
2. The method of claim 1, wherein each of the number of allocated interlaces comprises a plurality of non-contiguous resource blocks of the frequency spectrum.
3. The method of claim 1, wherein each of the number of allocated interlaces comprises a plurality of contiguous resource blocks of the frequency spectrum.
4. The method of claim 1, wherein each of the number of allocated interlaces comprises a plurality of resource blocks of the frequency spectrum, and wherein a first subset of the plurality of resource blocks are contiguous and a second subset of the plurality of resource blocks are non-contiguous.
5. The method of claim 1, wherein the one or more uplink channels comprise a physical uplink shared channel (PUSCH).
6. The method of claim 5, wherein the one or more resource blocks of the number of allocated interlaces for the PUSCH comprise non-adjacent resource blocks, and wherein a separate demultiplexed data stream is mapped to each resource block of the non-adjacent resource blocks.
7. The method of claim 5, wherein the one or more resource blocks of the number of allocated interlaces for the PUSCH comprise at least two adjacent resource blocks, and wherein one of the one or more demultiplexed data streams is mapped to each resource block of the at least two adjacent resource blocks.
8. The method of claim 5, wherein the plurality of resource elements are transmitted using single carrier frequency division multiple access (SC-FDMA) techniques.
9. The method of claim 8, wherein the method further comprises: performing a discrete Fourier transform (DFT) for each demultiplexed data stream.

10. The method of claim 5, wherein the plurality of resource elements are transmitted using orthogonal frequency division multiple access (OFDMA) techniques.
11. The method of claim 1, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH).
12. The method of claim 11, further comprising: performing a discrete Fourier transform (DFT) for at least one of the one or more demultiplexed data streams.
13. The method of claim 11, further comprising: determining a payload size of the data to be transmitted on the PUCCH; and encoding the data to be transmitted using an encoding scheme selected based on the payload size.
14. The method of claim 13, wherein encoding the data comprises selecting the encoding scheme to encode the data based at least in part on a threshold value of the payload size.
15. The method of claim 13, further comprising: rate matching the encoded data based at least in part on the number of allocated interlaces for the PUCCH.
16. The method of claim 15, further comprising: interleaving the rate-matched encoded data.
17. The method of claim 16, further comprising: scrambling the interleaved and rate-matched encoded data.
18. The method of claim 11, further comprising: spreading each of the one or more demultiplexed data streams using a spreading sequence.
19. The method of claim 11, further comprising: multiplexing each of the one or more demultiplexed data streams with a reference signal.
20. The method of claim 1, wherein the one or more uplink channels comprise a physical random access channel (PRACH).
21. The method of claim 20, further comprising: selecting a subset of the number of allocated interlaces for a random access request; and encoding the data to be transmitted into the data stream for the selected subset of the number of allocated interlaces.
22. The method of claim 21, further comprising: rate matching the encoded data based at least in part on the number of allocated interlaces to the PRACH.
23. The method of claim 22, further comprising: interleaving the rate-matched encoded data.
24. The method of claim 23, further comprising: scrambling the interleaved and rate-matched

encoded data.

25. The method of claim 20, further comprising: spreading each of the one or more demultiplexed data streams for each of the number of allocated interlaces; and performing a discrete Fourier transform (DFT) for each of the one or more demultiplexed data streams.

26. The method of claim 20, further comprising: multiplexing each of the one or more demultiplexed data streams for each of the number of allocated interlaces with a reference signal.

27. The method of claim 1, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH), a physical uplink shared channel (PUSCH), and a physical random access channel (PRACH).

28. The method of claim 27, wherein the each of the PUCCH, PUSCH, and PRACH comprises one or more clusters of allocated interlaces.

29. The method of claim 28, wherein each of the one or more clusters of allocated interlaces comprises the number of allocated interlaces for one of the PUCCH, PUSCH, or PRACH.

30. The method of claim 28, wherein the PUCCH comprises one or more clusters of allocated interlaces in a first uplink subframe of a radio frame.

31. The method of claim 28, wherein the PRACH comprises one or more clusters of allocated interlaces in a first uplink subframe of a radio frame.

32. The method of claim 28, wherein the PUSCH comprises a first subset of clusters of allocated interlaces in a first uplink subframe of a radio frame and a second subset of clusters of allocated interlaces for subsequent uplink subframes of the radio frame, the second subset of clusters of allocated interlaces having a different number of clusters of allocated interlaces than the first subset of clusters of allocated interlaces.

33. The method of claim 32, wherein clusters available for the first subset of clusters of allocated interlaces and the second subset of clusters of allocated interlaces are determined based on control signaling received from a base station.

34. An apparatus for wireless communication, comprising: a processor; a memory in electronic communication with the processor; and the processor and the memory configured to: identify an available bandwidth of a frequency spectrum; identify a minimum occupancy of the available bandwidth; obtain a data stream comprising data to be transmitted on one or more uplink channels, each of the one or more uplink channels comprising a number of allocated interlaces for an uplink transmission over the frequency spectrum, wherein each of the number of allocated interlaces comprises one or more resource blocks of the frequency spectrum, and wherein the one or more resource blocks of the number of allocated interlaces spans at least the minimum

occupancy of the available bandwidth; demultiplex the data stream to provide one or more demultiplexed data streams for the number of allocated interlaces; and map at least one of the one or more demultiplexed data streams onto a plurality of resource elements associated with the number of allocated interlaces.

35. The apparatus of claim 34, wherein each of the number of allocated interlaces comprises a plurality of non-contiguous resource blocks of the frequency spectrum.

36. The apparatus of claim 34, wherein each of the number of allocated interlaces comprises a plurality of contiguous resource blocks of the frequency spectrum.

37. The apparatus of claim 34, wherein each of the number of allocated interlaces comprises a plurality of resource blocks of the frequency spectrum, and wherein a first subset of the plurality of resource blocks are contiguous and a second subset of the plurality of resource blocks are non-contiguous.

38. The apparatus of claim 34, wherein the one or more uplink channels comprise a physical uplink shared channel (PUSCH).

39. The apparatus of claim 38, wherein the one or more resource blocks of the number of allocated interlaces for the PUSCH comprise non-adjacent resource blocks, and wherein a separate demultiplexed data stream is mapped to each resource block of the non-adjacent resource blocks.

40. The apparatus of claim 38, wherein the one or more resource blocks of the number of allocated interlaces for the PUSCH comprise at least two adjacent resource blocks, and wherein one of the one or more demultiplexed data streams is mapped to each resource block of the at least two adjacent resource blocks.

41. The apparatus of claim 38, wherein the plurality of resource elements are transmitted using single carrier frequency division multiple access (SC-FDMA) techniques.

42. The apparatus of claim 41, wherein the processor and the memory are further configured to: perform a discrete Fourier transform (DFT) for each of the one or more demultiplexed data streams.

43. The apparatus of claim 38, wherein the plurality of resource elements are transmitted using orthogonal frequency division multiple access (OFDMA) techniques.

44. The apparatus of claim 34, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH).

45. The apparatus of claim 44, wherein the processor and the memory are further configured to:

perform a discrete Fourier transform (DFT) for at least one of the one or more demultiplexed data streams.

46. The apparatus of claim 44, wherein the processor and the memory are further configured to: determine a payload size of the data to be transmitted on the PUCCH; and encode the data to be transmitted using an encoding scheme selected based on the payload size.

47. The apparatus of claim 46, wherein the processor and the memory further configured to select the encoding scheme to encode the data based at least in part on a threshold value of the payload size.

48. The apparatus of claim 46, wherein the processor and the memory are further configured to: rate match the encoded data based at least in part on the number of allocated interlaces for the PUCCH.

49. The apparatus of claim 48, wherein the processor and the memory are further configured to: interleave the rate-matched encoded data.

50. The apparatus of claim 49, wherein the processor and the memory are further configured to: scramble the interleaved and rate-matched encoded data.

51. The apparatus of claim 44, wherein the processor and the memory are further configured to: spread each of the one or more demultiplexed data streams using a spreading sequence.

52. The apparatus of claim 44, wherein the processor and the memory are further configured to: multiplex each of the one or more demultiplexed data streams with a reference signal.

53. The apparatus of claim 34, wherein the one or more uplink channels comprise a physical random access channel (PRACH).

54. The apparatus of claim 53, wherein the processor and the memory are further configured to: select a subset of the number of allocated interlaces for a random access request; and encode the data to be transmitted into the data stream for the selected subset of the number of allocated interlaces.

55. The apparatus of claim 54, wherein the processor and the memory are further configured to: rate match the encoded data based at least in part on the number of allocated interlaces to the PRACH.

56. The apparatus of claim 55, wherein the processor and the memory are further configured to: interleave the rate-matched encoded data.

57. The apparatus of claim 56, wherein the processor and the memory are further configured to:

scramble the interleaved and rate-matched encoded data.

58. The apparatus of claim 53, wherein the processor and the memory are further configured to: spread each of the one or more demultiplexed data streams for each of the number of allocated interlaces; and perform a discrete Fourier transform (DFT) for each of the one or more demultiplexed data streams.

59. The apparatus of claim 53, wherein the processor and the memory are further configured to: multiplex each of the one or more demultiplexed data streams for each of the number of allocated interlaces with a reference signal.

60. The apparatus of claim 34, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH), a physical uplink shared channel (PUSCH), and a physical random access channel (PRACH).

61. The apparatus of claim 60, wherein the each of the PUCCH, PUSCH, and PRACH comprises one or more clusters of allocated interlaces.

62. The apparatus of claim 61, wherein each of the one or more clusters of allocated interlaces comprises the number of allocated interlaces for one of the PUCCH, PUSCH, or PRACH.

63. The apparatus of claim 61, wherein the PUCCH comprises one or more clusters of allocated interlaces in a first uplink subframe of a radio frame.

64. The apparatus of claim 61, wherein the PRACH comprises one or more clusters of allocated interlaces in a first uplink subframe of a radio frame.

65. The apparatus of claim 61, wherein the PUSCH comprises a first subset of clusters of allocated interlaces in a first uplink subframe of a radio frame and a second subset of clusters of allocated interlaces for subsequent uplink subframes of the radio frame, the second subset of clusters of allocated interlaces having a different number of clusters of allocated interlaces than the first subset of clusters of allocated interlaces.

66. The apparatus of claim 65, wherein clusters available for the first subset of clusters of allocated interlaces and the second subset of clusters of allocated interlaces are determined based on control signaling received from a base station.

67. An apparatus for wireless communication, comprising: means for identifying an available bandwidth of a frequency spectrum; means for identifying a minimum occupancy of the available bandwidth; means for obtaining a data stream comprising data to be transmitted on one or more uplink channels, each of the one or more uplink channels comprising a number of allocated interlaces for an uplink transmission over the frequency spectrum, wherein each of the number of allocated interlaces comprises one or more resource blocks of the frequency spectrum,

and wherein the one or more resource blocks of the number of allocated interlaces spans at least the minimum occupancy of the available bandwidth; means for demultiplexing the data stream to provide one or more demultiplexed data streams for the number of allocated interlaces; and means for mapping at least one of the one or more demultiplexed data streams onto a plurality of resource elements associated with the number of allocated interlaces.

68. The apparatus of claim 67, wherein each of the number of allocated interlaces comprises a plurality of non-contiguous resource blocks of the frequency spectrum.

69. The apparatus of claim 67, wherein each of the number of allocated interlaces comprises a plurality of contiguous resource blocks of the frequency spectrum.

70. The apparatus of claim 67, wherein each of the number of allocated interlaces comprises a plurality of resource blocks of the frequency spectrum, wherein a first subset of the plurality of resource blocks are contiguous and a second subset of the plurality of resource blocks are non-contiguous.

71. The apparatus of claim 67, wherein the one or more uplink channels comprise a physical uplink shared channel (PUSCH).

72. The apparatus of claim 71, further comprising: means for performing a discrete Fourier transform (DFT) for each of the one or more demultiplexed data streams.

73. The apparatus of claim 67, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH).

74. The apparatus of claim 73, further comprising: means for performing a discrete Fourier transform (DFT) for at least one of the one or more demultiplexed data streams.

75. The apparatus of claim 73, further comprising: means for determining a payload size of the data to be transmitted on the PUCCH; and means for encoding the data to be transmitted using an encoding scheme selected based on the payload size.

76. The apparatus of claim 75, wherein the means for encoding the data comprises means for selecting the encoding scheme to encode the data based at least in part on a threshold value of the payload size.

77. The apparatus of claim 67, wherein the one or more uplink channels comprise a physical random access channel (PRACH).

78. The apparatus of claim 77, further comprising: means for selecting a subset of the number of allocated interlaces for a random access request; and means for encoding the data to be transmitted into the data stream for the selected subset of the number of allocated interlaces.

79. The apparatus of claim 78, further comprising: means for spreading each of the one or more demultiplexed data streams for each of the number of allocated interlaces; and means for performing a discrete Fourier transform (DFT) for each of the one or more demultiplexed data streams.

80. The apparatus of claim 67, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH), a physical uplink shared channel (PUSCH), and a physical random access channel (PRACH).

81. The apparatus of claim 80, wherein the each of the PUCCH, PUSCH, and PRACH comprises one or more clusters of allocated interlaces.

82. The apparatus of claim 81, wherein each of the PUCCH and the PRACH comprises one or more clusters of allocated interlaces in a first uplink subframe of a radio frame.

83. The apparatus of claim 81, wherein the PUSCH comprises a first subset of clusters of allocated interlaces in a first uplink subframe of a radio frame and a second subset of clusters of allocated interlaces for subsequent uplink subframes of the radio frame, the second subset of clusters of allocated interlaces having a different number of clusters of allocated interlaces than the first subset of clusters of allocated interlaces.

84. A non-transitory computer-readable medium storing computer-executable code for wireless communication, the code executable by a processor to: identify an available bandwidth of a frequency spectrum; identify a minimum occupancy of the available bandwidth; obtain a data stream comprising data to be transmitted on one or more uplink channels, each of the one or more uplink channels comprising a number of allocated interlaces for an uplink transmission over the frequency spectrum, wherein each of the number of allocated interlaces comprises one or more resource blocks of the frequency spectrum, and wherein the one or more resource blocks of the number of allocated interlaces spans at least the minimum occupancy of the available bandwidth; demultiplex the data stream to provide one or more demultiplexed data streams for the number of allocated interlaces; and map at least one of the one or more demultiplexed data streams onto a plurality of resource elements associated with the number of allocated interlaces.

85. The non-transitory computer-readable medium of claim 84, wherein each of the number of allocated interlaces comprises a plurality of non-contiguous resource blocks of the frequency spectrum.

86. The non-transitory computer-readable medium of claim 84, wherein each of the number of allocated interlaces comprises a plurality of contiguous resource blocks of the frequency spectrum.

87. The non-transitory computer-readable medium of claim 84, wherein each of the number of

allocated interlaces comprises a plurality of resource blocks of the frequency spectrum, wherein a first subset of the plurality of resource blocks are contiguous and a second subset of the plurality of resource blocks are non-contiguous.

88. The non-transitory computer-readable medium of claim 84, wherein the one or more uplink channels comprise a physical uplink shared channel (PUSCH).

89. The non-transitory computer-readable medium of claim 88, wherein the code is further executable by the processor to: perform a discrete Fourier transform (DFT) for each of the one or more demultiplexed data streams.

90. The non-transitory computer-readable medium of claim 84, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH).

91. The non-transitory computer-readable medium of claim 90, wherein the code is further executable by the processor to: perform a discrete Fourier transform (DFT) for at least one of the one or more demultiplexed data streams.

92. The non-transitory computer-readable medium of claim 90, wherein the code is further executable by the processor to: determine a payload size of the data to be transmitted on the PUCCH; and encode the data to be transmitted using an encoding scheme selected based on the payload size.

93. The non-transitory computer-readable medium of claim 92, wherein the code is further executable by the processor to select the encoding scheme to encode the data based at least in part on a threshold value of the payload size.

94. The non-transitory computer-readable medium of claim 84, wherein the one or more uplink channels comprise a physical random access channel (PRACH).

95. The non-transitory computer-readable medium of claim 94, wherein the code is further executable by the processor to: select a subset of the number of allocated interlaces for a random access request; and encode the data to be transmitted into the data stream for the selected subset of the number of allocated interlaces.

96. The non-transitory computer-readable medium of claim 95, wherein the code is further executable by the processor to: spread each of the one or more demultiplexed data streams for each of the number of allocated interlaces; and perform a discrete Fourier transform (DFT) for each of the one or more demultiplexed data streams.

97. The non-transitory computer-readable medium of claim 84, wherein the one or more uplink channels comprise a physical uplink control channel (PUCCH), a physical uplink shared channel (PUSCH), and a physical random access channel (PRACH).

98. The non-transitory computer-readable medium of claim 97, wherein the each of the PUCCH, PUSCH, and PRACH comprises one or more clusters of allocated interlaces.

99. The non-transitory computer-readable medium of claim 98, wherein each of the PUCCH and the PRACH comprises one or more clusters of allocated interlaces in a first uplink subframe of a radio frame.

100. The non-transitory computer-readable medium of claim 98, wherein the PUSCH comprises a first subset of clusters of allocated interlaces in a first uplink subframe of a radio frame and a second subset of clusters of allocated interlaces for subsequent uplink subframes of the radio frame, the second subset of clusters of allocated interlaces having a different number of clusters of allocated interlaces than the first subset of clusters of allocated interlaces.