

CLAIMS

What is Claimed:

1. A method for transmitting uplink control information (UCI) comprising:
a wireless transmit receive unit (WTRU) determining that a transmission of UCI overlaps with a grant free (GF) transmission on a physical uplink shared channel (PUSCH);
the WTRU determining to not transmit the GF transmission on the PUSCH;
the WTRU determining to transmit the UCI on a physical uplink control channel (PUCCH); and
the WTRU transmitting the UCI on the PUCCH.
2. The method of claim 1,
wherein the UCI comprises HARQ/ACK information.
3. The method of claim 1,
wherein determining the transmission of UCI overlaps with the GF transmission on the PUSCH comprises determining the transmission of the UCI overlaps with the GF transmission in a slot.
4. The method of claim 1, further comprising:
transmitting the GF transmission on the PUSCH,
wherein the UCI is transmitted on the PUCCH before transmitting the GF transmission on the PUSCH.
5. The method of claim 4,
wherein transmitting the UCI comprises transmitting the UCI in a first slot; and
wherein transmitting the GF transmission comprises transmitting the GF transmission in a second slot, the second slot immediately following the first slot.
6. The method of claim 1, further comprising:
the WTRU receiving configuration information,
wherein determining to not transmit the GF transmission comprises determining to not transmit the GF transmission based on the configuration information.

7. The method of claim 6, wherein receiving configuration information comprises receiving radio resource control (RRC) configuration information.
8. The method of claim 1, wherein determining to not transmit the GF transmission comprises determining to not transmit the GF transmission based on an absence of configuration information.
9. The method of claim 1, further comprising:
 - the WTRU determining a transmission of a second UCI overlaps with a second grant free (GF) transmission on a physical uplink shared channel (PUSCH);
 - the WTRU determining to multiplex the second UCI and the second GF transmission on the PUSCH;
 - the WTRU multiplexing the second UCI and the second GF transmission on the PUSCH; and
 - the WTRU transmitting the second UCI and second GF transmission on the PUSCH.
10. The method of claim 9, further comprising:
 - the WTRU receiving configuration information;
 - wherein determining to multiplex the second UCI and the second GF transmission on the PUSCH comprises determining to multiplex the second UCI and the second GF transmission on the PUSCH based on the configuration information.
11. A wireless transmit receive unit (WTRU) comprising:
 - a processor configured at least to:
 - determine that a transmission of UCI overlaps with a grant free (GF) transmission on a physical uplink shared channel (PUSCH);
 - determine to not transmit the GF transmission on the PUSCH;
 - determine to transmit the UCI on a physical uplink control channel (PUCCH); and
 - transmit the UCI on the PUCCH.
12. The WTRU of claim 11,
 - wherein the UCI comprises HARQ/ACK information.
13. The WTRU of claim 11, wherein the processor is further configured to:
 - determine the transmission of the UCI overlaps with the GF transmission in a slot.

14. The WTRU of claim 11, wherein the processor is further configured to:
transmit the GF transmission on the PUSCH,
wherein the UCI is transmitted on the PUCCH before transmitting the GF transmission on the PUSCH.
15. The WTRU of claim 14,
wherein the UCI is transmitted in a first slot; and
wherein the processor is further configured to transmit the GF transmission in a second slot,
the second slot immediately following the first slot.
16. The WTRU of claim 11, wherein the processor is further configured to:
receive configuration information; and
determine to not transmit the GF transmission based on the configuration information.
17. The WTRU of claim 16, wherein the configuration information comprises radio resource control (RRC) configuration information.
18. The WTRU of claim 11, wherein the processor is further configured to:
determine to not transmit the GF transmission based on having not received configuration information.
19. The WTRU of claim 11, wherein the processor is further configured to:
determine a transmission of a second UCI overlaps with a second grant free (GF) transmission on a physical uplink shared channel (PUSCH);
determine to multiplex the second UCI and the second GF transmission on the PUSCH;
multiplex the second UCI and the second GF transmission on the PUSCH; and
transmit the second UCI and second GF transmission on the PUSCH.
20. The WTRU of claim 19, wherein the processor is further configured to:
receive configuration information; and
determine to multiplex the second UCI and the second GF transmission on the PUSCH based on the configuration information.