

CLAIMS

WHAT IS CLAIMED IS:

1. ——— A method for wireless communication by a first device, comprising:
 - ~~_receiving from a second device a first data packet in one or more receiving slots of a time division duplex (TDD) frame;~~
 - ~~_determining whether the first data packet is received incorrectly;~~
 - ~~waiting until an end of the switching from a receiving mode to a transmitting mode during a first symbol in a slot after the one or more receiving slots; and~~
 - ~~transmitting to the second device a first negative acknowledgement signal (NACK) in a NACK at least one feedback symbol in a the slot after the end of the one or more receiving slots in response to determining that the first data packet is received incorrectly, wherein the first symbol comes one symbol before the at least one feedback symbol.~~
2. ——— ~~The method of claim 1, further comprising:~~
 - ~~receiving a second packet in the slot from a third device during a receiving mode;~~
 - ~~switching from the receiving mode to a transmitting mode during a first turnaround symbol in the slot in order to transmit the first NACK in the NACK feedback symbol;~~
 - ~~wherein the first turnaround symbol comes one symbol before the NACK feedback symbol;~~
 - ~~and~~
 - ~~switching from the transmitting mode back to the receiving mode during a second turnaround symbol in the slot, wherein the second turnaround symbol comes one symbol after the NACK feedback symbol.~~
3. ——— ~~The method of claim 2, further comprising:~~
 - ~~switching by the first device to the transmitting mode to transmit a third packet in a subsequent slot following the slot after transmitting the first NACK in the NACK feedback symbol in the slot.~~
4. ——— ~~The method of claim 2, wherein the slot comprises a first slot that follows the one or more receiving slots, the NACK feedback symbol comprising a symbol thirteen of the slot, the first turnaround symbol comprising symbol twelve of the slot, and the second turnaround symbol comprising symbol fourteen of the slot.~~

5. ~~The method of claim 2, wherein the slot comprises a second slot that is separated from the one or more receiving slots by at least one slot, the NACK at least one feedback symbol comprises a second and an additional symbol of the slot, the first turnaround-symbol comprises a first symbol of the slot, and the second turnaround-symbol comprises a third the second symbol of the slot.~~

6. ~~3. The method of claim 21, wherein the slot is at a configurable number of slots after the one or more receiving slots.~~

7. ~~The method of claim 1, further comprising:~~

~~receiving a second packet in the slot from a third device during a receiving mode;
switching from the receiving mode to a transmitting mode during a first turnaround portion of the NACK feedback symbol of the slot; and~~

~~switching from the transmitting mode back to the receiving mode during a second turnaround portion of the NACK feedback symbol of the slot,~~

~~and wherein transmitting to the second device the first NACK in the NACK feedback symbol in the slot comprises transmitting the first NACK in a transmitting portion of the NACK feedback symbol of the slot during the transmitting mode.~~

8. ~~The method of claim 7, wherein the NACK feedback symbol comprise a larger sub-carrier spacing than a sub-carrier spacing of other symbols in the one or more receiving slots and wherein the transmitting portion of the NACK feedback symbol is less than a symbol length of the NACK feedback symbol.~~

9. ~~4. The method of claim 1, further comprising:~~

~~—receiving, by the first device from a third device, one or more additional data packets in the one or more receiving slots;~~

~~—determining whether the one or more additional data packets are received correctly;
and~~

~~—transmitting to the third device an additional NACK with the first NACK in the NACK at least one feedback symbol in the slot in response to determining that the one or more additional data packets are received incorrectly.~~

10. ~~5. The method of claim 94, wherein a number of the one or more receiving slots is configurable for receiving the first data packet and the one or more additional data packets.~~

~~11.~~—6. The method of claim 1, wherein the ~~NACK~~at least one feedback symbol comprises a symbol after every N slots of the TDD frame and wherein the ~~NACK~~at least one feedback symbol is dedicated to transmitting the NACK.

~~12.~~—7. The method of claim 1, wherein the NACK comprises one or more additional feedback bits transmitted in the ~~NACK~~at least one feedback symbol.

~~13.~~—8. The method of claim ~~12~~7, wherein the one or more additional feedback bits are transmitted by the first device in a unicast transmission.

~~14.~~—9. The method of claim ~~12~~7, wherein the one or more additional feedback bits comprise a reference signal that is transmitted by the first device on one of every N subcarriers of the ~~NACK~~at least one feedback symbol.

~~15.~~—A method for wireless communication by a first device, comprising:

~~—contending for use of one or more slots of a time division duplex frame for~~

~~transmitting~~10. The apparatus of claim 1, wherein each slot of the one or more slots includes a plurality of symbols;

~~—transmitting at least a portion of a first data packet is comprised in a first sidelink transmission, and the one or more slots;~~

~~—reserving a first feedback symbol~~NACK is comprised in a first transmitting slot of the one or more slots for reception of a negative acknowledgement signal (NACK) from one or more devices; andsecond sidelink transmission.

~~—refraining from transmitting the first packet during the first feedback symbol of the first transmitting slot.~~

~~16.~~—The method of claim 15, further comprising the first device filling a first symbol that is one symbol before the first feedback symbol and a second symbol that is one symbol after the first feedback symbol with the portion of the first packet after filling other symbols in the one or more slots.

~~17.~~—11. The method of claim 16, wherein the first feedback symbol comprises symbol thirteen of the first transmitting slot, the first symbol comprises symbol twelve of the first

transmitting slot, and the second symbol comprises symbol fourteen of the first transmitting slot.

18. — ~~The method of claim 15~~1, further comprising the first device:

~~; switching from the transmitting mode back to a~~the receiving mode ~~after the one or more slots; and~~

~~during a second symbol in the slot, wherein the second symbol comes one symbol after the at least one feedback symbol; and receiving a first NACK from the one or more devices in a second feedback symbol of a slot after an end of the one or more slots, wherein the first NACK is received in response to the one or more devices receiving the first packet incorrectly~~second data packet during the one or more slots~~receiving mode.~~

12. The method of claim 11, further comprising: switching by the first device to the transmitting mode to transmit a third packet in a subsequent slot following the slot after transmitting the NACK in the at least one feedback symbol in the slot.

19. — ~~The method of claim 18~~13. The method of claim 11, wherein the slot comprises a first slot that follows the one or more receiving slots, ~~and the second~~at least one feedback symbol ~~comprises~~comprising a symbol thirteen of the slot.

20. — ~~The method of claim 18, wherein, the slot comprises a second slot that is separated from the one or more slots by at least one slot, and the second feedback~~first symbol ~~comprises a second symbol of the slot.~~

21. — ~~The method of claim 18, wherein the slot is at a configurable number of slots after the one or more slots.~~

22. — ~~The method of claim 18, further comprising: symbol twelve of the slot, and the second symbol comprising symbol fourteen of the slot.~~

~~— receiving the first NACK during a~~14. The method of claim 1, wherein the at least one feedback symbol comprises at least one NACK feedback symbol for transmitting only NACK feedback.

15. A method for wireless communication by a first device, comprising: receiving ~~portion of the from a~~ second feedback symbol of the slot.

23. — ~~A method for wireless communication by~~device a first device, comprising:

~~data packet in one or more receiving slots of a time division duplex (TDD) frame;~~

~~_determining whether the first data packet is received incorrectly;~~

~~waiting until a set of dedicated symbols to transmit a first negative acknowledgement signal (NACK); and~~

~~transmitting switching from a receiving mode to the second device the first a transmitting mode during a first turnaround portion comprised in a negative acknowledgement signal (NACK) feedback symbol of a slot; transmitting to the second device a first NACK in the NACK feedback symbol in the set of dedicated symbols a transmitting portion comprised in the NACK feedback symbol that occurs in the slot after an end of the one or more receiving slots in response to determining that the first data packet is received incorrectly; switching from the transmitting mode back to the receiving mode during a second turnaround portion of the NACK feedback symbol of the slot; and receiving a second packet in the slot from a third device during the receiving mode.~~

24.—~~16.~~ The method of claim ~~23~~15, wherein the set ~~NACK feedback symbol~~ NACK feedback symbol ~~comprise a larger sub-carrier spacing than a sub-carrier spacing of dedicated other symbols comprises occurrences spaced by a number of~~ comprise a larger sub-carrier spacing than a sub-carrier spacing of dedicated other symbols comprises occurrences spaced by a number of in the one or more receiving slots and wherein the transmitting portion of the NACK feedback symbol is less than a symbol length of the NACK feedback symbol.

25.—~~17.~~ The method of claim ~~24~~, wherein each occurrence of the set of dedicated symbols ~~comprises at least three symbols.~~

26.—~~The method of claim 23~~15, wherein the set of dedicated symbols is reserved by a communication system for feedback first data packet is comprised in a first sidelink transmission, and the first NACK is comprised in a second sidelink transmission.

27.—~~The method of claim 23, wherein the set of dedicated symbols comprises symbols within one of the one or more receiving slots.~~

28.—~~The method of claim 23, wherein the set of dedicated symbols comprises standalone symbols outside of the one or more receiving slots.~~

29.—~~The method of claim 23, wherein the one or more receiving slots containing the first data packet for which the NACK is transmitted is offset from the set of dedicated symbols by one or more offset slots.~~

18. An apparatus for wireless communication by a first device, comprising: memory; and at least one processor coupled to the memory and configured to: receive from a second device a first data packet in one or more receiving slots of a time division duplex (TDD) frame; determine whether the first data packet is received incorrectly; switch from a receiving mode to a transmitting mode during a first symbol in a slot after the one or more receiving slots; and transmit to the second device a NACK in the at least one feedback symbol in the slot after the one or more receiving slots in response to determining that the first data packet is received incorrectly, wherein the first symbol comes one symbol before the at least one feedback symbol.

30. — The method of claim 29, wherein the
19. The apparatus of claim 18, wherein the slot is at a configurable number of slots after the one or more offset receiving slots.

20. The apparatus of claim 18, wherein the first data packet is comprised in a first sidelink transmission, and the NACK is comprised in a second sidelink transmission.

21. The apparatus of claim 18, wherein the at least one processor is further configured to: receive, by the first device from a third device, one or more additional data packets in the one or more receiving slots; determine whether the one or more additional data packets are ~~configurable-~~received correctly; and transmit to the third device an additional NACK with the NACK in the at least one feedback symbol in the slot in response to determining that the one or more additional data packets are received incorrectly.

22. The apparatus of claim 21, wherein a number of the one or more receiving slots is configurable for receiving the first data packet and the one or more additional data packets.

23. The apparatus of claim 18, wherein the at least one feedback symbol comprises a symbol after every N slots of the TDD frame and wherein the at least one feedback symbol is dedicated to transmitting the NACK.

24. The apparatus of claim 18, wherein the NACK comprises one or more additional feedback bits transmitted in the at least one feedback symbol.

25. The apparatus of claim 24, wherein the one or more additional feedback bits are transmitted by the first device in a unicast transmission.

26. The apparatus of claim 24, wherein the one or more additional feedback bits comprise a reference signal that is transmitted by the first device on one of every N subcarriers of the at least one feedback symbol.

27. The apparatus of claim 18, wherein the at least one processor is further configured to: switch from the transmitting mode back to the receiving mode during a second symbol in the slot, wherein the second symbol comes one symbol after the at least one feedback symbol; and receive a second data packet during the receiving mode.

28. The apparatus of claim 27, wherein the at least one processor is further configured to: switch by the first device to the transmitting mode to transmit a third packet in a subsequent slot following the slot after transmitting the NACK in the at least one feedback symbol in the slot.

29. The apparatus of claim 27, wherein the slot comprises a first slot that follows the one or more receiving slots, the at least one feedback symbol comprising a symbol thirteen of the slot, the first symbol comprising symbol twelve of the slot, and the second symbol comprising symbol fourteen of the slot.

30. The apparatus of claim 27, wherein the slot comprises a second slot that is separated from the one or more receiving slots by at least one slot, the at least one feedback symbol comprises an additional symbol of the slot, the first symbol comprises a first symbol of the slot, and the second symbol comprises the second symbol of the slot.

31. The apparatus of claim 18, wherein the at least one feedback symbol comprises at least one NACK feedback symbol for transmitting only NACK feedback.

32. An apparatus for wireless communication by a first device, comprising: memory; and at least one processor coupled to the memory and configured to: receive from a second device a first data packet in one or more receiving slots of a time division duplex (TDD) frame; determine whether the first data packet is received incorrectly; switch from a receiving mode to a transmitting mode during a first turnaround portion comprised in a negative acknowledgement signal (NACK) feedback symbol of a slot; transmit to the second device a first NACK in the NACK feedback symbol in a transmitting portion comprised in the NACK feedback symbol that occurs in the slot after an end of the one or more receiving slots in response to determining that the first data packet is received incorrectly; switch from the transmitting mode back to the receiving mode during a second turnaround portion of the NACK feedback symbol of the slot; and receive a second packet in the slot from a third device during the receiving mode.

33. The apparatus of claim 32, wherein the NACK feedback symbol comprise a larger sub-carrier spacing than a sub-carrier spacing of other symbols in the one or more receiving slots and wherein the transmitting portion of the NACK feedback symbol is less than a symbol length of the NACK feedback symbol.

34. The apparatus of claim 32, wherein the first data packet is comprised in a first sidelink transmission, and the first NACK is comprised in a second sidelink transmission.