

We claim:

1. A method of reducing the effect of self interference in a first device, the method comprising: receiving a first portion of a wireless signal of interest from a second device in a first frequency band; performing a transmission timing synchronization operation to synchronize transmitter symbol timing, used for communications in a second frequency band which is different from said first frequency band, with the symbol timing of the received wireless signal of interest based on the received first portion of the wireless signal of interest; transmitting a signal including a symbol into said second frequency band in accordance with said transmitter symbol timing; and performing an interference cancellation operation on a received signal, received in said first frequency band, including a second portion of the wireless signal of interest to cancel interference caused by transmitting said symbol into said second frequency band.
2. The method as claimed in claim 1, wherein said first and second frequency bands are adjacent non-overlapping frequency bands; and wherein performing an interference cancellation operation includes performing said interference cancellation operation in the frequency domain on a per symbol basis.
3. The method as claimed in claim 1, wherein said receiving is performed by a receiver; wherein said transmitting is performed by a transmitter; the method further comprising: estimating a channel between said transmitter and said receiver, said step of estimating the channel between said transmitter and said receiver including: transmitting from said transmitter, a known signal into a frequency band into which said transmitter transmits signals; receiving via said receiver the known signal in a frequency band in which said receiver receives signals, said frequency band in which said receiver receives signals being different from and adjunct said frequency band into which said transmitter transmits signals; and estimating the channel based on the known signal transmitted from said transmitter and received by said receiver.

4. The method as claimed in claim 1, wherein said first and second frequency bands are Dedicated Short Range Communications (DSRC) bands for direct device to device communications; and wherein said first and second frequency bands are adjacent frequency bands.

5. The method as claimed in claim 4, wherein performing an interference cancellation operation on a received signal including a second portion of said wireless signal of interest includes: generating an expected interference signal component based on the estimated channel between the transmitter and receiver and known content of the transmitted signal; and removing the expected interference signal component from the received signal including a second portion of the signal of interest; and wherein said known content includes information regarding tone symbols in at least one transmitted OFDM symbol.

6. The method as claimed in claim 4, wherein said first DRSC band is used for communicating safety information and said second DRSC band is used for communicating non-safety information.

7. The method as claimed in claim 1, wherein performing a transmission timing synchronization operation includes: delaying transmission of a symbol of the transmitted signal so that a cyclic prefix of a symbol to be transmitted at least partially overlaps a cyclic prefix of a symbol included in the received wireless signal of interest.

8. The method as claimed in claim 7, further comprising: maintaining symbol level timing synchronization between said received wireless signal of interest and said transmitted signal to within the duration of a cyclic prefix for a period of time.

9. A first device comprising: means for receiving a first portion of a wireless signal of interest from a second device in a first frequency band; and means for performing a transmission timing synchronization operation to synchronize transmitter symbol timing, used for communications in a second frequency band which is different from said first frequency band, with the symbol timing of the received wireless signal of interest based on the received first portion of the received wireless signal of interest; means for transmitting a signal including a symbol into said second frequency band in accordance with said transmitter symbol timing; and means for performing an interference cancellation operation on a received signal, received in said first frequency band, including a second portion of the wireless signal of interest to cancel interference caused by transmitting said symbol into said second frequency band.

10. The first device as claimed in claim 9, wherein said first and second frequency bands are adjacent non-overlapping frequency bands; and wherein said means for performing an interference cancellation operation includes means for performing said interference cancellation operation in the frequency domain on a per symbol basis.

11. The first device as claimed in claim 9, wherein said means for receiving is a receiver; and wherein said means for transmitting is a transmitter; the first device further comprising: means for estimating a channel between said transmitter and said receiver, said means for estimating the channel between said transmitter and said receiver estimating said channel based on a known signal transmitted from said transmitter into a frequency band into which said transmitter transmits signals and received by said receiver in a frequency band in which said receiver receives signals, said frequency band in which said receiver receives signals being different from and adjunct said frequency band into which said transmitter transmits signals.

12. The first device as claimed in claim 9, wherein said first and second frequency bands are Dedicated Short Range Communications (DSRC) bands for direct device to device

communications; and wherein said first and second frequency bands are adjacent frequency bands.

13. The first device as claimed in claim 12, wherein said means for performing an interference cancellation operation on said received signal including a second portion of said signal of interest includes: means for generating an expected interference signal component based on the estimated channel between the transmitter and receiver and known content of the transmitted signal; and means for removing the expected interference signal component from the received signal including a second portion of the signal of interest; and wherein said known content includes information regarding tone symbols in at least one transmitted OFDM symbol.

14. The first device as claimed in claim 9, wherein said means for performing a transmission timing synchronization operation includes: means for delaying transmission of a symbol of the transmitted signal so a cyclic prefix of a symbol to be transmitted at least partially overlaps a cyclic prefix of a symbol included in the received wireless signal of interest.

15. The first device as claimed in claim 14, further comprising: means for maintaining symbol level timing synchronization between said received wireless signal of interest and said transmitted signal to within the duration of a cyclic prefix for a period of time.

16. A first device comprising: at least one processor configured to: receive a first portion of a wireless signal of interest from a second device in a first frequency band; and perform a transmission timing synchronization operation to synchronize transmitter symbol timing, used for communications in a second frequency band which is different from said first frequency band, with the symbol timing of said received wireless signal of interest based on the received first portion of the received wireless signal of interest; transmit a signal including a symbol into said second frequency band in accordance with said transmitter symbol timing; and perform an

interference cancellation operation on a received signal, received in said first frequency band, including a second portion of the wireless signal of interest to cancel interference caused by transmitting said symbol into said second frequency band; and memory coupled to said at least one processor.

17. The first device as claimed in claim 16, wherein said first and second frequency bands are adjacent non-overlapping frequency bands; and wherein said at least one processor is configured to perform said interference cancellation operation in the frequency domain on a per symbol basis, as part of being configured to performing an interference cancellation operation.

18. The first device as claimed in claim 16, wherein said at least one processor is configured to control a receiver to perform receiving operations; wherein said at least one processor is configured to control a transmitter to perform transmitting operations; and wherein said at least one processor is further configured to estimate a channel between said transmitter and said receiver based on a known signal transmitted from said transmitter into a frequency band into which said transmitter transmits signals and received by said receiver in a frequency band in which said receiver receives signals, said frequency band in which said receiver receives signals being different from and adjunct said frequency band into which said transmitter transmits signals.

19. The first device as claimed in claim 16 wherein said at least one processor is further configured to generate an expected interference signal component based on the estimated channel between the transmitter and receiver and known content of the transmitted signal; and removing the expected interference signal component from the received signal including a second portion of the signal of interest, as part of being configured to perform an interference cancellation operation on said received signal including a second portion of the signal of interest.

20. The first device as claimed in claim 19, wherein said known content includes information regarding tone symbols in at least one transmitted OFDM symbol.

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Satyoki Koundinya
[SATYOKI KOUNDINYA]
OF REMFRY & SAGAR
ATTORNEY FOR THE APPLICANT[s]