

CLAIMS

1. A system comprising of:
 - a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,
 - a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,
 - wherein the first wireless network creates one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas.
2. The system as in claim 1 wherein the one or the plurality of points of zero RF energy are created to mitigate out-of-band emission (OOBE) or blocking from the first wireless network to the second wireless network.
3. The system as in claim 1 wherein the first wireless network is a multi-user multiple antenna system (MU-MAS) that uses precoding to create the one or the plurality of points of zero RF energy.
4. The system as in claim 3 wherein the precoding is computed based on channel state information (CSI) between the plurality of wireless transceiver stations of the first wireless network and the one or the plurality of antennas of the second wireless network.
5. The system as in claim 4 wherein the CSI is estimated using in-band or out-of-band training signals sent over a plurality of wireless links between the wireless transceiver stations and the one or the plurality of antennas.

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6. A system comprising of:

a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,

a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,

wherein the first wireless network creates one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas, and

the second wireless network has no knowledge of TDD operation of the first wireless network.

7. A system comprising of:

a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,

a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,

wherein the first wireless network creates one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas, and the second wireless network has knowledge of TDD operation of the first wireless network.

8. A system comprising of:

a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,

a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,

wherein the first wireless network creates one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas, and the first wireless network provides terrestrial wireless services and the second wireless network provides wireless services to aircrafts.

9. A method for communicating over a network comprising:

a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,

a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,

the first wireless network creating one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas.

10. The method as in claim 9 wherein the one or the plurality of points of zero RF energy are created to mitigate out-of-band emission (OOBE) or blocking from the first wireless network to the second wireless network.

11. The method as in claim 9 wherein the first wireless network is a multi-user multiple antenna system (MU-MAS) that uses precoding to create the one or the plurality of points of zero RF energy.

12. The method as in claim 11 wherein the precoding is computed based on channel state information (CSI) between the plurality of wireless transceiver stations of the first wireless network and the one or the plurality of antennas of the second wireless network.

13. The method as in claim 12 wherein the CSI is estimated using in-band or out-of-band training signals sent over a plurality of wireless links between the wireless transceiver stations and the one or the plurality of antennas.

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14. A method for communicating over a network comprising:

a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,

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a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,

the first wireless network creating one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas, and

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the second wireless network having no knowledge of TDD operation of the first wireless network.

15. A method for communicating over a network comprising:

a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,

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a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,

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the first wireless network creating one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas, and

the second wireless network having knowledge of TDD operation of the first wireless network.

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16. A method for communicating over a network comprising:
- a first wireless network operating in TDD mode and comprising of a plurality of wireless transceiver stations that share the same cell ID and collectively transmit a plurality of simultaneous non-interfering precoded data streams to a plurality of user equipment (UE) within the same frequency band,
 - a second wireless network operating in FDD mode and comprising of one or a plurality of antennas,
 - the first wireless network creating one or a plurality of points of zero radio frequency (RF) energy at the location of the one or at least one of the plurality of antennas, and the first wireless network providing terrestrial wireless services and the second wireless network providing wireless services to aircrafts.