China Academy of Telecommunication Technology

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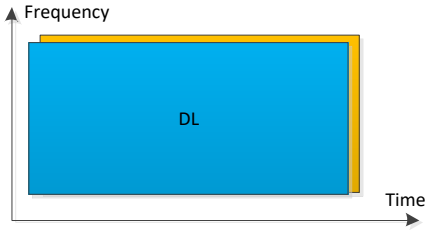
3GPP TSG RAN Rel-18 workshop
ELECTRONIC MEETING, JUNE 28 - JULY 2, 2021
DOCUMENT FOR: DISCUSSION
Agenda Item: 4.3

On duplexing enhancements in Rel-18

China Academy of Telecommunications Technology (CATT)

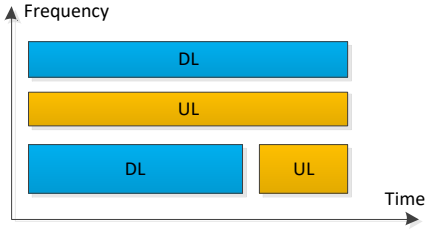
Duplexing Enhancements

- Full duplex
  - Cat.1 full duplex: Full duplexing with simultaneous transmission and reception on same time and frequency resource
  - Cat.2 full duplex: Full duplexing with simultaneous transmission and reception in time domain but separated in frequency domain



Cat.1 Full duplex

- Potential benefits of full duplex
  - Reducing bidirectional link latency for TDD system
  - Increasing coverage and capacity of UL for TDD system
  - Boosting the aggregated DL and UL data throughput

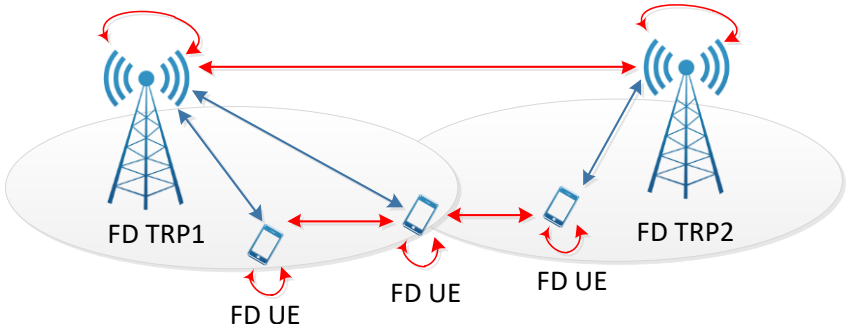


Cat.2 Full duplex

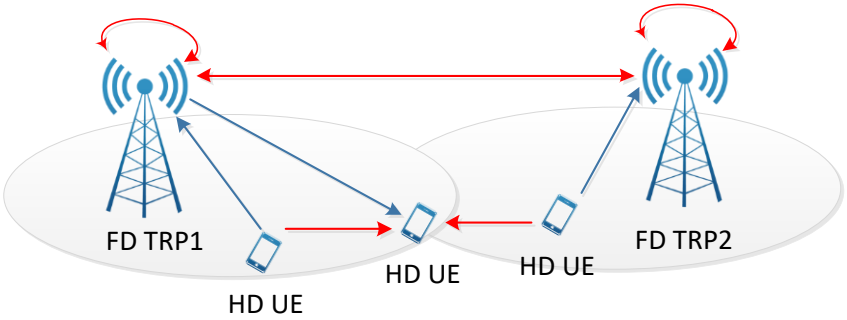
Duplexing Enhancements

- Scenario 1: Full duplex (FD) TRP and FD UE
  - Self interference at TRP and at UE
  - Inter-cell cross-link interference between TRPs
  - Bidirectional intra-cell interference between UEs
  - Bidirectional inter-cell interference between UEs
- Scenario 2: FD TRP and half duplex (HD) UE
  - Self interference at TRP
  - Inter-cell cross-link interference between TRPs
  - Intra-cell interference between UEs
  - Inter-cell interference between UEs

Observation: Full duplexing at both TRP and UE leads to intractable interference



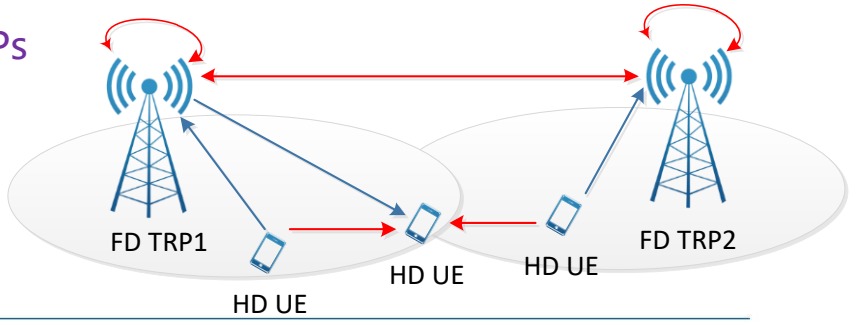
Scenario 1: FD TRP and FD UE



Scenario 2: FD TRP and HD UE

Duplexing Enhancements

- Technology components to enable full duplex
  - Self-interference cancellation/suppression, e.g,
    - Spatial domain isolation, beam nulling etc
    - RF signal cancellation
    - Digital domain cancellation/suppression
  - Intra-cell/inter-cell cross-link interference management
    - Measurement and reporting to facilitate interference management
    - Interference mitigation schemes, e.g., spatial domain separation, power control etc
    - Mechanism of coordination among TRPs



Duplexing Enhancements

- Potential work for study of full duplex
  - Identify deployment scenarios/use cases/frequency band for operation of full duplex
  - Study the methodology of evaluating full duplex schemes, including at least channel model, performance metric and baseline system configuration
  - Study the feasibility of self-interference cancellation/suppression, taking into account practical effects such as coupling interference and echoes from the environment
  - Study and identify solutions for inter-cell/intra-cell interference management
  - Evaluate the performance gain of full duplex in terms of agreed performance metric over the agreed baseline system

THANK YOU