

Motivation for new SI on Massive Beamforming for SCell Coverage

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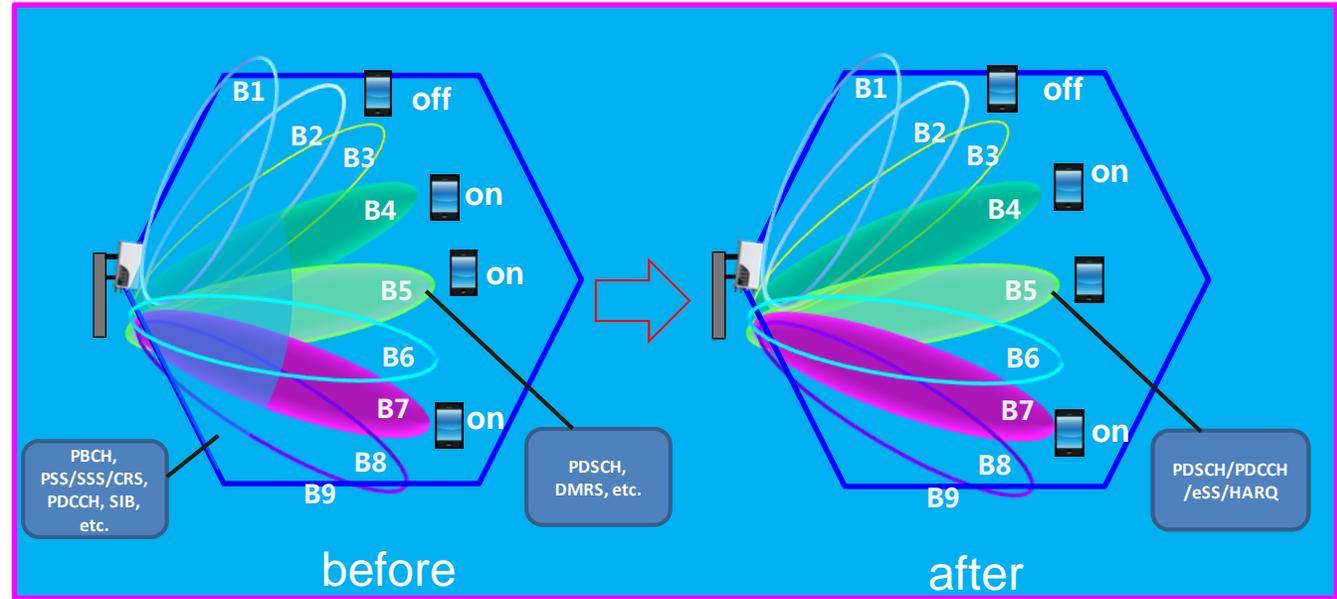
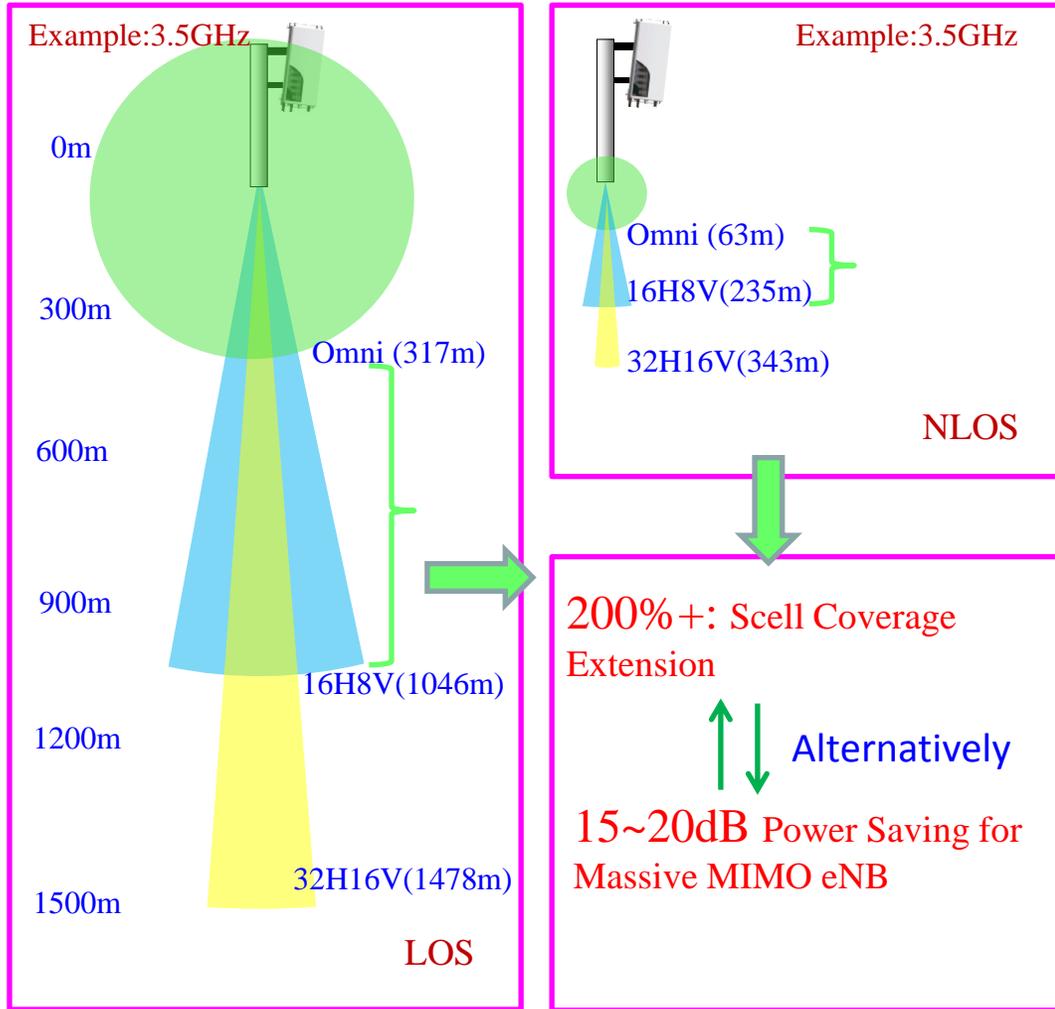
Background and Motivation(1)

- Background
 - Massive Beamforming provides both throughput and coverage improvement through beamformed channels
 - The design of MIMO has shifted from CRS-based scheme to DMRS-based scheme to support beamformed channels such as PDSCH/EPDCCH
 - Multiple beamformed CSI-RS is standardized in Rel-13 for a UE and the UE may perform the beam selection and report to eNB for data transmission
- Coverage improvement
 - The coverage improvement of PDSCH/EPDCCH/DMRS/CSI-RS is supported by beamforming in Rel-13
 - The coverage gap between beamformed channels e.g. PDSCH and other channels are larger when the number of TRUX is larger
 - Other channels: PBCH/PSS/SSS/PDCCH/CRS/PDSCH based on CRS etc

Background and Motivation(2)

- Coverage improvement of Scell
 - Pcell-assisted coverage enhancement of Scell can be considered in CA scenario
 - Particularly in the scenario that Pcell is in the low frequency band
 - EPDCCH in Scell can be supported
 - Coverage of LTE legacy Scell is still limited by omni-emission of synchronization signal (i.e. PSS/SSS/CRS/DRS).
 - The independent time-frequency tracking and beam tracking in Scell is necessary for a UE
- Motivation
 - Enhancement of Scell coverage with massive beamforming in CA scenario

Massive BF for Scell Coverage (MBSC)



- Massive antennas are used more than user throughput boosting...
- MBSC: Massive beamforming for Scell "control" coverage/SDMA, coverage extension or power saving through necessary channels/signals beamforming
 - Synchronization signals (a.k.a PSS/SSS/CRS/DRS in legacy LTE releases) enhancements with beamforming
 - Pcell aided synchronization procedure including beam searching, tracking, on/off and adaptation

Proposed WI Objectives

The WI assumes legacy eNB antenna configuration with {1, 2, 4, 8} TXRU, as well as massive MIMO eNB with up to 64 TXRU. The WI intends to provide enhancements for SCell coverage in CA scenarios. The WI will focus on enhancements to support efficient beamforming of signals used for synchronization.

- The detailed objectives of the WI are to identify and specify necessary enhancements to the following functionalities:
 - Beamforming of signals used for UE synchronization signals (a.k.a PSS/SSS/CRS/DRS in legacy LTE releases) [RAN1]
 - Pcell aided synchronization procedure including beam searching, tracking, on/off and adaptation [RAN1, RAN2]
 - Specify the necessary UE core requirements [RAN4]