RP-180321

Motivation for New SID: Study on NR design above 52.6GHz

3GPP RAN# 79

Chennai, India, March 19-22, 2018

Agenda Item: 9.1.2

Background & Justification

Background

- NR Rel-15 WI has considered up to 52.6GHz
- Larger spectrum availability in above 52.6GHz
- **Potential use cases**
  - V2X, IAB, NR-licensed, NR-unlicensed, Non-terrestrial, etc.

Challenges for above 52.6 GHz

- higher phase noise
- extreme propagation loss due to high atmospheric absorption
- lower power amplifier efficiency
- strong power spectral density regulatory
- co-existence with other radio communication technologies, e.g. V2X, IEEE 802.11ad/ay

Initiate SI in Q3' 2018 with following objectives:

- Physical layer design for above 52.6GHz [RAN1, RAN4]
  - Waveform, e.g., SC-QAM, DFT-s-OFDM, OFDM, etc.
  - Physical signals/channels
- Channelization [RAN4]

Other Related WI

Study on NR-based Access to Unlicensed Spectrum

- Study of physical channels inheriting NR SI studies and avoids unnecessary divergence with design in NR Rel-15 WI.
- Considers unlicensed band above 52.6 GHz to the extent that waveform design principles unchanged with respect to below 52.6 GHz bands.

Study on evaluation methodology of new Vehicle-to-Everything V2X use cases for LTE and NR

- The ITU-R recommends technical and operation characteristics for millimeter wave radio communication system for ITS applications in the frequency band of 57 to 66 GHz.
- Frequency band 63 to 64 GHz (or potentially 76 to 81 GHz) has been identified as band that ITS providing traffic safety and traffic efficiency application for all over Europe.

SI Proposal

Goal

- 3GPP NR system that efficiently support all frequency below 100 GHz.

Initiate SI in the Q3' 2018 with following objectives:

- Study of physical layer design for above 52.6GHz [RAN1, RAN4]
  - Waveform, e.g. SC-QAM, DFT-s-OFDM, CP-OFDM, etc.
  - Physical signals/channels
- Channelization suitable for target bands above 52.6 GHz [RAN4]
- This design should take into consideration the following aspects:
  - Efficient transceiver design, including power efficiency and complexity
  - Improvement of coverage to cope with extreme propagation loss
  - Inheriting physical layer channel design for below 52.6 GHz from NR Rel-15 WI whenever applicable.
  - Harmonized co-existence with potential radio communication technologies in above 52.6 GHz bands.

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