3GPP TSG RAN #102
Edinburgh, Scotland, December 11-15, 2023
Agenda: 9.1.4.2

RP-233590

Views on RF/OTA topics for RAN4 Rel-19

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Focused RF/OTA topics

RF topics

- Enhancement for power domain
- Spatial EIRP mask for 6GHz
- Improvement for BS antenna model
- further simplification of band combination
- simplification of BS specifications

OTA topics

- FR2 OTA enhancement for simultaneous transmission with multi-panel (STxMP)
- MIMO OTA enhancements to support dynamic channel based test methodology and define requirements for FR1/FR2 new bands
- FR1 TRP TRS enhancement

Note: this document is a subset of RP-233589 Views on RF/OTA/RRM topics for RAN4 Rel-19 in agenda 9.1.4.1, which intends to highlight our views on RF non-spectrum and OTA topics in agenda 9.1.4.2

Enhancement for power domain

- Justification: To fully utilize the UE transmit power with higher efficiency, the two methods of reporting more power parameters and reducing MPR is intensely discussed in RAN4 release 18.
  - » MPR reduction is introduced in release 18 by allowing 1dB power boosting gain for both pi/2 BPSK and QPSK with PC3 as well as PC2. However, this is based on keeping MPR requirements while increasing the UE transmitting power, which is not always applied to the UE doesn't support power boosting. So MPR reduction is still necessary to be further evaluated comparing to the existing MPR requirements.
  - » Reporting the parameter $\Delta P_{\text{PowerClass}}$ is introduced for FR1 deployments, on a per cell basis. This mechanism allows network to know the UE power class information more precisely and to adjust the attainable transmitting and receiving power level timely. The parameter of $\Delta P_{\text{PowerClass}}$ depend on the dutycycle solution of which the evaluation period, start and end timing are up to UE implementation. Such information shall be also shared to BS for the timing of $\Delta P_{\text{PowerClass}}$ changes.

Enhancement for power domain

- Objective:
  - » MPR reduction for specific power class
    - Specify MPR reduction requirement including power boosting for specific power class under relaxed ACLR or EVM requirements or narrower bandwidth for each Tx
    - Further study and confirm the resource range of inner and outer for MPR reduction under some mechanisms as PAPR reduction
  - » Continue optimize the power class related reporting solution
    - Introduce ‘duration’ information (e.g., a UE can sustain UL at a previously or concurrently reported PCmax) report for FR1
    - Consider UE full-power transmission capability report method, and specify the corresponding configuration/indication method for full-power transmission mode
    - Discuss to distinguish UE capabilities about SAR solution for single carrier /CA/DC and whether to introduce P-MPR report in FR1
  - » Increase UE power high limit for more power class cases
    - Extend the capability for increasing power high limit to more power class use cases including, PC2 + PC3 for 3Tx architecture, PC1.5 + PC2/PC3 for 3Tx architecture
    - An general framework e.g. removing the cap of CA power class is a straight forward way to simplify introducing the power class combinations

BS part improvement

- Spatial EIRP mask for Fixed Satellite Service UL protection
  - » Justification: The coexistence between IMT and FSS is expected to happen in more scenarios in future as higher frequency range like 6GHz is developed and assigned to IMT in China. The spatial EIRP mask have been proposed in ITU-R, which shows more benefit for BS with AAS when coexist with FSS.
  - » Objective: Specify RF core requirement for Spatial EIRP and define the corresponding test requirements.
- Improvement for BS antenna models
  - » Justification: More higher spectrum are proposed in 3GPP, the coexistence scenarios with other non-IMT systems is anticipated to be studied in future. However, the BS antenna models as one of the most coexistence study parameters have not been updated since a long time, which may not reflect the state of art BS performance.
  - » Objective: Study and improve the BS antenna models based on both simulations and measurements

Simplification of specifications

- Study on further simplification of UE RF specification for band combination
  - » Continue the study on band combination simplification for additional cases, to improve the UE RF specification quality as well as alleviate the workload for delegates.
- Study on simplification of BS specifications
  - » Large number of CRs need to provided to BS specifications when introducing a new band
  - » Simplify the BS specifications, especially for requirements that are just duplicate among the specifications and needs to update when introducing a new band.

Thanks!