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Views on Candidate Topics Impacting both RF/OTA and RRM/Demod for Rel-19

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Non-collocated intra-band CA/ Inter-band EN-DC with overlapping DL bands

- Motivation
  - > Different UE architecture types (2,3 and 4) were discussed during Rel18. non colocated deployment was defined for a UE architecture type 2(2 layers/CC, suitable for non-collocated deployment).

UE Type	CC#	antenna / LNA		Mixer	Analog BB	#Rx	NRCA/ ENDC	power imbalance	comment
[3a]	1	4 shared		4	4	4Rx	ENDC	6<P≤25dB partial range	Reuse of baseline RFFE architecture adding 2LO/BB/Rx and RF split after 2 LNAs out of 4 => common AGC on LNA => 25dB partial range
	2			2	2	2Rx			
[3b]	1	4 shared		4	4	4Rx	NRCA ENDC	6<P≤25dB partial range	Reuse of baseline RFFE architecture adding 2LO/BB/Rx and RF split after all 4 LNAs => common AGC on LNA => 25dB partial range
	2			4	4	4Rx			
[4a]	1	4	6 Total	4	4	4Rx	ENDC	25dB full range	Requires 6 antennas and LNA => is it compatible with smartphone? (for which frequency range), FWA only
	2	2		2	2	2Rx			
[4b]	1	4	8 total	4	4	4Rx	NRCA ENDC	25dB full range	Requires 8 antennas and LNA => is it compatible with smartphone? (for which frequency range), FWA only
	2	4		4	4	4Rx			

  - > In WF R4-2306605, it was agreed to postepone type 3 and type 4,for non-contiguous intra-band CA, to a future release. It is better to have it on Rel19.
  - > With type 3 and 4, the throughput will be increased as they, both, support 4 layers/CC in DL.
  - > The following issues should be considered:
    - > Type 3: As 1 LNA (and AGC) is shared between two RF chains (2 layers), if the MRTD <CP, the cells will be too small and makes the implementation useless.
    - > Type 4: As it will use 4 LNAs (1 for every RF chain), its primary target would be FWA UEs, however it could be used in larger handheld UEs (such as foldable phones)

Non-collocated intra-band CA/ Inter-band EN-DC with overlapping DL bands

- Objectives
  - > Specify the following aspects for UE architecture type 4 with max 4-layer MIMO for NR CA and EN-DC:
    - > Maximum tolerable power imbalance between carriers in DL
    - > Maximum arrival time difference between CCs in DL.
    - > Specify the UE capability for UE architecture type 4 .(similar to *intraBandNR-CA-non-collocated-r18)*
    - > Extend the *nonCollocatedTypeNR-CA-r18* NW IE or define a new one to include type 4 indication.
  - > Study and specify the above mentioned aspects for UE architecture type 3, if companies opinions converge on it (second priority)
  - > Specify non-collocated contiguous 2CC and non-contiguous 3CC for intra-band NR-CA (Type 2/3/4) and inter-band EN-DC (second priority)

SL RAN4 enhancements

- Objectives
  - > Rel-18 leftovers
  - > Intra-band non-contiguous CA

ATG enhancements

- Motivation
  - In Rel-18, RAN4 completed the ATG standardization considering both Synchronized and non-Synchronized coexistence scenarios.
  - In May 2023, Chinese Ministry of Industry and Information Technology release trial spectrum (4.9GHz) to CMCC for ATG technical testing. Link is below.
    - https://www.miit.gov.cn/xwdt/gxdt/sjdt/art/2023/art_0b4a6a7703ad4b1884e7c65ab83c84af.html
  - There is a demand from operators to enhance the throughput and system capability.

- Objective
  - CA to enhance throughput and capacity for ATG UE, including intra-band CA and inter-band CA
    - Investigate if the existing CA band combinations can be reused for ATG or to specify new ATG-specific CA band combinations.
    - Investigate if Delta Tib and Rib are applicable to ATG UE.
    - Specify the Tx requirements for ATG UE, e.g. maximum output power requirements, configured output power .
    - Specify the Rx requirements for ATG UE, e.g. REFSENS requirements .