

Source: NTT DOCOMO, INC.
Agenda item: 4.3

Study on Full duplex for NR

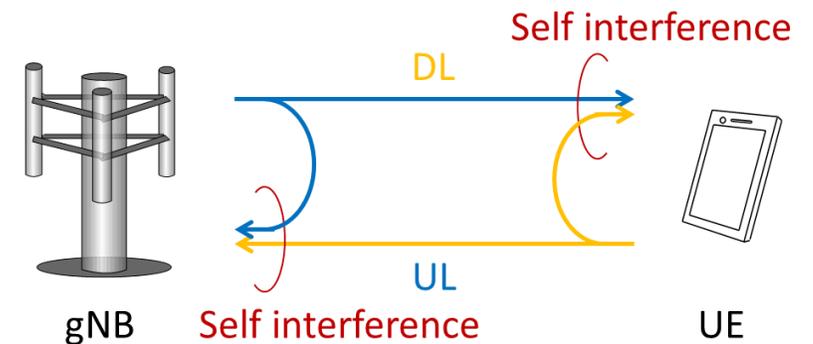
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■ Background

- Full duplex (FD) realizes efficient and flexible UL and DL resource configuration with providing following benefits, and thus, can be one of key features for “5G advanced”
 - » Beneficial for adaptation to DL and UL traffic fluctuation, e.g. expecting UL heavy traffic
 - » Beneficial for lower latency and coverage improvement with increasing UL time resources
- FD operation among access and backhaul links for IAB-node was discussed, on the other hand, no specific mechanism for the operation has been specified.
- Sub-band based FD, also known as “XDD” [1], was proposed, with tackling the technical challenges while achieving the benefits of FD.
 - Initial step toward realizing spectrum sharing FD.

■ Technical challenge for FD

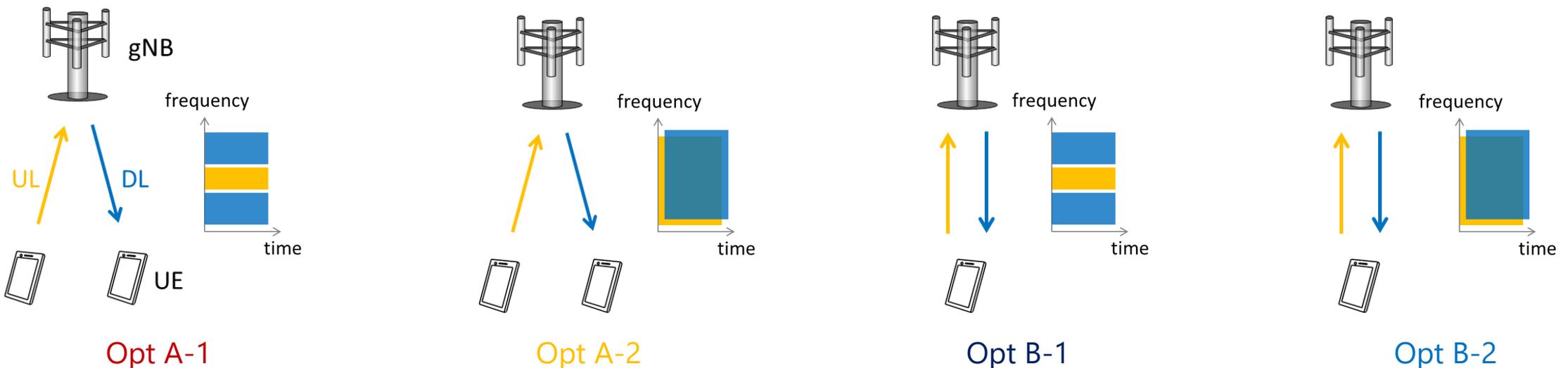
- On top of cross link interference (CLI) in Dynamic TDD, self interference should be managed



[1] 3GPP, RP-210293, Samsung, “Initial Views on Release 18 NR,” March. 2021.

Options for full duplex

- Final goal for FD is **Opt B-2** (FD operation at gNB and UE with spectrum sharing), and phased approach is possible way with considering the technical and implementation challenges (e.g. device size, supporting number of antenna beams), so that following options can be considered.
- FD operating node**
 - Opt A:** FD operation at gNB only, and half duplex operation at UE
 - Opt B:** FD operation at both gNB and UE
- Frequency resource for FD**
 - Opt A-1/B-1:** Frequency resource does not overlap for DL and UL (Sub-band based FD)
 - Opt A-2/B-2:** Frequency resource overlaps for DL and UL (Spectrum sharing FD)



■ Phased approach for FD study and normative work

• Rel-18

» **Step 1 : Study for spectrum sharing and sub-band based FD at least for gNB (Opt A-1 and A-2)**

» **Potential study points for step 1**

- Self Interference management
- Applicable frequency band/range
- Applicable duplex mode (TDD/FDD)
- Deployment scenario, e.g. Rural, Urban, Indoor
 - ✓ Multiple links (access and backhaul links) for IAB-node
- Antenna configuration, e.g. single/multiple antenna ports/panels
- MIMO operation for FD
- Specification impact

• Rel-19 onwards

» Step 2 : Normative work for FD based on the outcome of Step 1

- Sub-band based FD (Opt A-1) is a candidate technology

» Step 3 : Further study/discuss FD, based on the outcome of Step 1, e.g. spectrum sharing FD (Opt A-2), and extending scope for FD operation at UE (Opt B-1 and B-2)