

Agenda Item: 8.1.2.1

Source: National Taiwan University

Title: **Preliminary evaluation of CPS-OFDM waveform in Case 2, Case 3, and Case 4**

Document for: Discussion and Decision

## 1 Introduction

New radio (NR) waveform design is based on OFDM with potential support of non-orthogonal property and multiple access [1]. In our related work [2]-[3], CPS-OFDM waveform characterized by precoder flexibility with multiple access support is proposed to be one of 5G NR waveform candidates. In this document, we provide some preliminary evaluation results of CPS-OFDM waveform in Case 2, 3 and 4 according to the parameters given in [4]-[5]. We also show the corresponding performance comparisons with legacy OFDM and DFT-s-OFDM waveforms [6].

## 2 Performance Evaluation

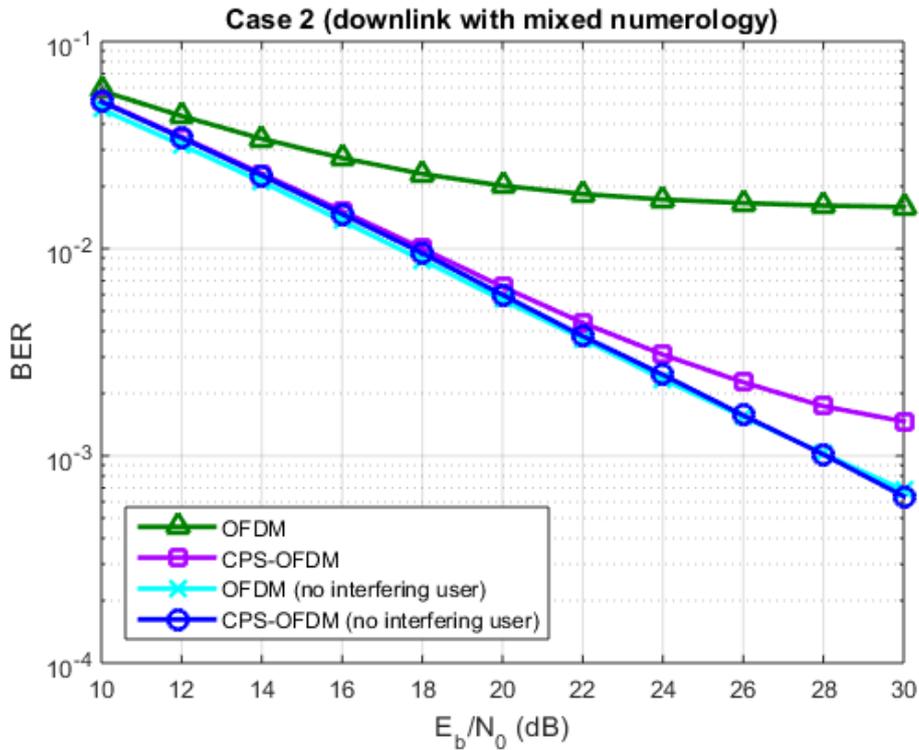


Figure 1: BER performance for downlink with mixed numerology

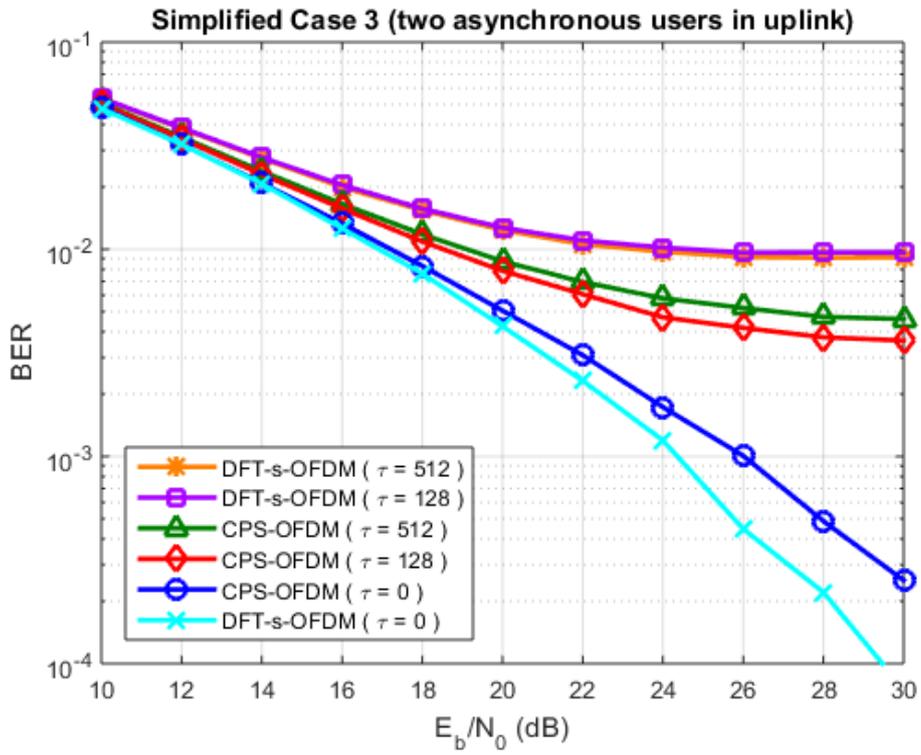


Figure 2: BER performance for two asynchronous uplink users

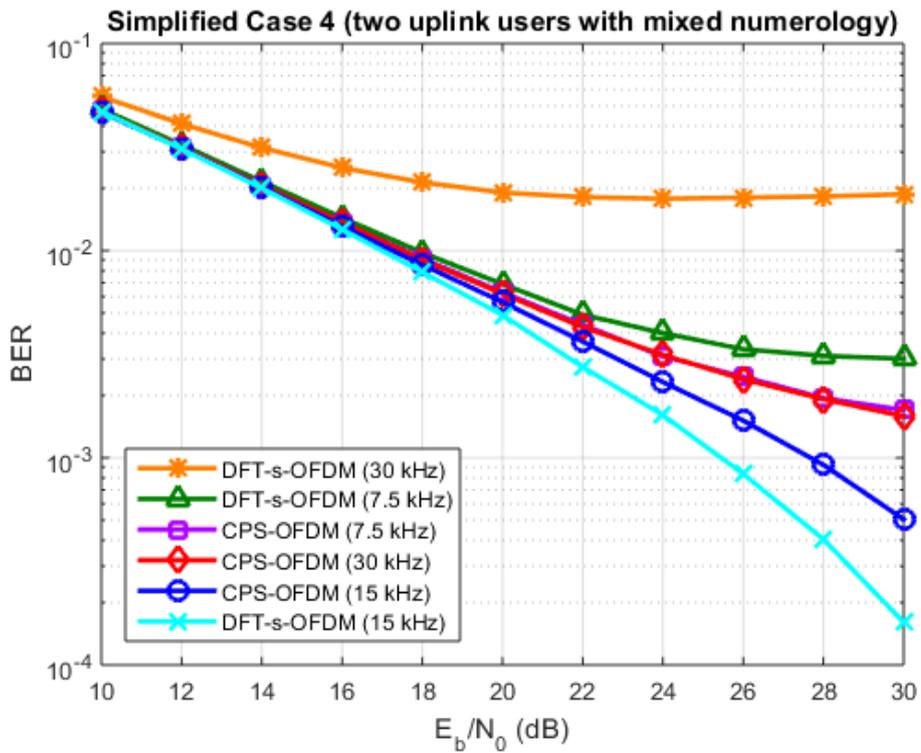


Figure 3: BER performance for two uplink users with mixed numerology

## References

- [1] NTT DOCOMO, “New SID proposal: study on new radio access technology,” 3GPP RAN #71 Meeting, Technical Document RP-160351, Gothenburg, Sweden, March 7-10, 2016.
- [2] National Taiwan University, “Fundamentals of CPS-OFDM waveform for 5G new radio,” 3GPP RAN1 #86 Meeting, Technical Document R1-167820, Gothenburg, Sweden, Aug. 22-26, 2016.
- [3] National Taiwan University, “OFDM-based waveform with precoding techniques,” 3GPP RAN1 #85 Meeting, Technical Document R1-165113, Nanjing, China, May 23-27, 2016.
- [4] Huawei and HiSilicon, “Way forward on assumptions for waveform evaluation,” 3GPP RAN1 #84bis Meeting, Technical Document R1-163558, Busan, Korea, Apr. 11-15, 2016.
- [5] Huawei, HiSilicon, NTT DOCOMO, and Nokia, “Way forward on calibration assumptions for NR waveform,” 3GPP RAN1 #85 Meeting, Technical Document R1-165989, Nanjing, China, May 23-27, 2016.
- [6] 3GPP, “RAN1 chairman’s notes,” New Radio (NR) in RAN1#85 meeting, Nanjing, China, May 23-27, 2016.