**3GPP TSG RAN WG1 Meeting #101-e R1-200xxxx**

**E-Meeting, May 25 – June 5, 2020**

**Agenda Item: 6.2.1.3**

**Source: Huawei, HiSilicon**

**Title: Text proposal on clarification of sub-PRB symbol counter reset**

**Document for: Discussion and Decision**

# Introduction

This document provides the text proposal as outcomes of the following email discussion [1]:

[101-e-LTE-eMTC5-Multi-TB-02] Minor corrections – Johan (Ericsson)

* Consider TP in Proposal 3 (on sub-PRB symbol counter reset) in R1-2004696
* Consider TP in Proposal 4 (on SPS handling) in R1-2004696
* Consider TP in Proposal 5 (on removal of scheduling gap after last SC-MTCH TB) in R1-2004696

# Discussion

## TP on clarification of sub-PRB symbol counter reset

**Reason for changes:**

The description on the symbol counter reset for sub-PRB in multi-TB transmission may introduce ambiguity on whether it’s reset at the start of the transmission of each transport block or the first TB of the *NTB* transport blocks.

**Summary of changes:**

It is clarified that the symbol counter for sub-PRB in multi-TB transmission is reset only at the start of the first PUSCH transport block of the *NTB* transport blocks.

**Specs/sections impacted:**

36.212 sections 6.4.3.1

**Consequences if not approved:**

There may be ambiguity whether the symbol counter for sub-PRB in multi-TB transmission is reset only at the start of the first PUSCH TB or each TB of the *NTB* transport blocks.

**-----------------------------------------------------Start of Text Proposal---------------------------------------------**

**<Unchanged parts are omitted>**

5.6A.2 Modulation scheme π/2-BPSK

**<Unchanged parts are omitted>**

For $M\_{sc}^{RU}=3$ and π/2-BPSK modulation only 2-of-3 adjacent subcarriers are selected as described in 5.5.2.1A.2. The time-continuous signal  in SC-FDMA symbol  in an uplink slot is defined by

 

for  where , ,  is given by Table 5.6-1, and $a\_{k,l}$$a\_{k,l}$ and  are respectively the modulation value for subcarrier index  and $k+1$$k+1$ for symbol , and the values of  used on  and  are respectively obtained by subtracting  from the resulting set of allocated subcarriers as described in Table 8.1.6-1 of [4], and  represents the lower subcarrier index among the selected subcarriers and  is the subcarrier index adjacent to it. The phase rotation  is given by

$$ϕ=\frac{π}{2}\left(\tilde{l} mod 2\right)+φ\_{avg\_{k}}\left(\tilde{l}\right)$$

$$ φ\_{avg\_{k}}\left(\tilde{l}\right)=φ\_{avg\_{k}}\left(\tilde{l}-1\right)+2πΔf\left(k+1\right)\left(N+N\_{CP,l}\right)T\_{s} when \tilde{l}>0$$

$$φ\_{avg\_{k}}\left(0\right)=0$$

$$ \tilde{l}=0,1,…,N\_{TB}N\_{rep}^{PUSCH}M\_{RU}M\_{slots}^{UL}M\_{symb}^{UL}-1$$

$$l= \tilde{l} mod M\_{symb}^{UL}$$

where $N\_{TB}$ is the number of transport blocks defined in clause 8.0 of 3GPP TS 36.213 [4]. If $N\_{TB}$ >1 and interleaving between codewords is applied according to clause 8.0 of 3GPP TS 36.213 [4], then the symbol counter  is reset at the start of the first PUSCH codeword transmission and incremented for each symbol during the transmission of the $N\_{TB}$ PUSCH codewords . For other cases, the symbol counter  is reset at the start of each PUSCH codeword transmission and incremented for each symbol during the transmission of the PUSCH codeword.

**<Unchanged parts are omitted>**

**-----------------------------------------------------End of Text Proposal---------------------------------------------**

# References

1. R1-200xxxx Feature lead summary #2 for Multi-TB scheduling for LTE-MTC Moderator (Ericsson)