**3GPP TSG RAN WG1 #105-e R1-210xxxx**

**e-Meeting, May 10th – 27th, 2021**

**Agenda Item: 6.2.2**

**Source: Moderator (Huawei)**

**Title: Feature lead summary #1 on [105-e-LTE-NB\_IoTenh3-01]**

**Document for: Discussion and Decision**

# Introduction

This contribution provides discussion on the following issue:

[105-e-LTE-NB\_IoTenh3-01] Correction on DMRS cyclic shift for PUR in NB-IoT – Xiang (Huawei)

* Discussion and decision by May 24, TPs by May 27

# Discussions

## Issue

**Description**: Regarding NB-IoT PUR, contribution [1] points out that the parameter *npusch-CyclicShift* is only used for the DMRS in PUR transmission. However, the current spec does not limit the use case of this parameter. Therefore, [1] proposes to adopt the following TP#1 to specify that the parameter *npusch-CyclicShift* for DMRS cyclic shift is only for PUR transmission. Otherwise, the *npusch-CyclicShift* for DMRS cyclic shift dedicated for PUR may be wrongly used in some non-PUR scenarios (e.g., msg3).

**TP#1**: The following TP#1 for TS 36.211 is proposed by [1]:

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| --------------------------- Text starts (TS 36.211 clause 10.1.4.1.2)-----------------------------10.1.4.1.2 Reference signal sequence for **<Unchanged parts are omitted>**The reference signal sequences for is defined by a cyclic shift  of a base sequence according to ,where  is given by Table 10.1.4.1.2-1 for , Table 10.1.4.1.2-2 for  and Table 5.5.1.2-1 for . If group hopping is not enabled, the base sequence index  is given by higher layer parameters *threeTone-BaseSequence*, *sixTone-BaseSequence*, and *twelveTone-BaseSequence* for , , and , respectively. If not signalled by higher layers, the base sequence is given byIf group hopping is enabled, the base sequence index  is given by clause 10.1.4.1.3.The cyclic shift  for  and  is derived from higher layer parameters *threeTone-CyclicShift* and *sixTone-CyclicShift*, respectively, as defined in Table 10.1.4.1.2-3. For , if *npusch-CyclicShift* is configured it provides the value of $n\_{cs}$ and the cyclic shift $α$ in a slot  is given as $α=2πn\_{cs}/12$ for NPUSCH (re)transmission corresponding to preconfigured uplink resource, otherwise .**<Unchanged parts are omitted>**--------------------------- Text ends (TS 36.211 clause 10.1.4.1.2)----------------------------- |

## Question

**Question: Do you agree with TP#1 above?**

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| **Company** | **Agree?** | **Comments** |
| Lenovo,MotoM | Agree | *npusch-CyclicShift* is configured in *pur-PhysicalConfig,* and the two parameters are only used for PUR other than non-PUR case. So the CR clarification is needed. |
| Qualcomm |  | Technically speaking, *npusch-CyclicShift* is configured only for PUR, so in all other cases “if *npusch-CyclicShift* is configured” will be false, and therefore we will use alpha = 0. But if a clear majority of companies feel this clarification would lead to better readability, we will not object. |
| Ericsson | See comment | We have a similar view as Qualcomm. We would be ok with the clarification, but perhaps the issue can be simply solved by appending “*PUR-Config-NB*” to “*npusch-CyclicShift*”. That is:**<Unchanged parts are omitted>**If group hopping is enabled, the base sequence index  is given by clause 10.1.4.1.3.The cyclic shift  for  and  is derived from higher layer parameters *threeTone-CyclicShift* and *sixTone-CyclicShift*, respectively, as defined in Table 10.1.4.1.2-3. For , if *npusch-CyclicShift* in *PUR-Config-NB* is configured it provides the value of $n\_{cs}$ and the cyclic shift $α$ in a slot  is given as $α=2πn\_{cs}/12$, otherwise .**<Unchanged parts are omitted>** |
| ZTE, Sanechips | Agree | From our understanding, the current specification indicates this parameter *npusch-CyclicShift* is assumed for all the NPUSCH transmission (e.g. the PUSCH in connected mode or msg3), before this parameter released or reconfiguration.It seems that the revision from Ericsson can not resolve the above issue.  |
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# Summary

# Reference

1. R1-2105269 Correction on DMRS cyclic shift for PUR in NB-IoT ZTE