

Source: Ericsson
Title: Clarification of WCDMA channel simulator settings for application E
Document for: Discussion and decision
Agenda Item:

1. Introduction

The AMR wideband performance requirements specify a set of parameters of the WCDMA channel simulator. These parameters are to be adopted for generating the FER and RBER profiles, which are used when assessing the performance of the wideband speech codec in application E.

The present set of parameters may lead to misinterpretations, or is not inline with [1] specifying the physical channels and mapping of transport channels onto physical channels for WCDMA channels. The purpose of this document is to provide the necessary clarification and guidance enabling the generation of WCDMA channel error profiles inline with the specification.

2. Present parameter setting

The following list is a recollection from the bulleted parameter list of the performance requirement document S4/SMG11 Tdoc 90/00:

- Maximum source bitrate is [32 kbit/s], errored frames of size [20 ms] will be used
- Spreading factor is [64]
- CRC size class a is [16 bits]
- Urban outdoor channel profile
- 3 km/h UE speed
- TFCI bits included
- Normal frames (not compressed)
- No DL transmitter diversity
- 2 pilot bits
- One gain factor

3. Interpretation and proposed change of parameters

3.1 Spreading factor

For the UL, [1] specifies a number of slot formats for the DPDCH, depending on the spreading factor. A spreading factor of 64 implies a channel bit rate of 60 kbps. However, assuming rate $\frac{1}{2}$ encoding of the speech coder bits a 32 kbps speech codec mode could not simply be accommodated. It is therefore proposed to apply a spreading factor of 32 for UL channel simulations.

For the DL, a spreading factor of 64 and rate $\frac{1}{2}$ channel coding of the speech coding bits is feasible. Thus, no change of this setting is proposed.

3.2 2 pilot bits

For UL, no slot formats for the DPCCH using 2 pilot bits are defined. As outlined below, it is proposed to use slot format #0. This means that a number of 6 pilot bits are used per slot.

For DL, for a spreading factor of 64 no slot formats using 2 pilot bits are defined. According to the below proposal to use slot format #12, a number of 8 pilot bits will be used.

3.3 One gain factor

This relates to the gain factors to be used for the DPCCH and the DPDCH. In general different gain factors for DPCCH and DPDCH could only be applied in order to be optimal. However, the gain factors for DPCCH and DPDCH are assumed to be equal.

4. ***Additional parameters***

4.1 Slot format for UL

A spreading factor of 32 for the UL implies slot format #3 to be used for the DPDCH. For DPCCH non-compressed frame formats and no DL transmitter diversity imply to use slot format #0.

4.2 Slot format for DL

A spreading factor of 64 for the DL and non-compressed frame format imply slot format #12 to be used for DPDCH and DPCCH.

4.3 Channel coding

Channel coding based on convolutional codes is used.

4.4 Rate matching

In order to accomplish the generation of FER and RBER patterns, which match the required pairs of values (e.g. FER=1%, RBER=0.1%), proper rate matching for the class A and class B bits need to be applied.

4.5 Other simulation parameters

Other simulation settings, as e.g. power control and channel estimation should be as realistic as possible.

References

[1] 3rd Generation Partnership Project; Technical Specification Group Access Network; Physical channels and mapping of transport channels onto physical channels (FDD), 3G TS 25.211 version 3.1.0