Source : LGIC

Title   : CR to 25.212 for Clarification of Fixed Position Rate Matching

Document for : Approval

Introduction

In current specification, there are no explicit definitions of $\Delta N_{i,l}^{TTI}$ for fixed position rate matching. Therefore there may be misunderstandings that $\Delta N_{i,l}^{TTI}$ does not depend on the TF *l*. The effective amount of rate matching for fixed position RM, $\Delta N_{i,l}^{TTI}$ may vary according to the different fixed rate matching pattern. It means that the effective amount of rate matching may have different values according to the different e_{ini} and *ù*'of the rate matching pattern determination algorithm. In this CR, explicit expressions of $\Delta N_{i,l}^{TTI}$ both for convolutional codes and turbo codes are provided just for clarification and information. If it is possible to represent $\Delta N_{i,l}^{TTI}$ with exact formula, the meaning of fixed position RM can be more easily understood, since the formula represents explicitly that the effective amount of RM is a function of the ratio between $N_{i,l}^{TTI}$ and N_{max}.

Text Proposal

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

| **25.212** CR **034** | Current Version: | 3.1.0 |

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **TSG-RAN #7**
list expected approval meeting # here ↑

for approval **X**
for information ☐

strategic ☐
non-strategic ☐

(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects:
(at least one should be marked with an X)

(U)SIM ☐   ME **X**   UTRAN / Radio **X**   Core Network ☐

Source: LGIC   **Date:** 2000-01-10

Subject: Clarification of fixed position rate matching

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	**X**	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	**X**
Release 00	

Reason for change:
The current description for the block size variation $\Delta N_{i,l}^{TTI}$ is not explicitly defined, therefore it may give rise to misunderstanding that it does not depend on the TF *l*.

Clauses affected:
4.2.7.2.1.1 Uncoded and convolutionally encoded TrCHs
4.2.7.2.1.2 Turbo encoded TrCHs

Other specs affected:

Other 3G core specifications	☐	→ List of CRs:
Other GSM core specifications	☐	→ List of CRs:
MS test specifications	☐	→ List of CRs:
BSS test specifications	☐	→ List of CRs:
O&M specifications	☐	→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

4.2.7.2.1.1 Uncoded and convolutionally encoded TrCHs

$$\Delta N_i = \Delta N_{max}$$

$\underline{a}a=2$

$$N_{max} = \max_{l \in TFS(i)} N_{il}^{TTI}$$

For each transmission time interval of TrCH i with TF l, the rate-matching pattern is calculated with the algorithm in section 4.2.7.5. The following parameters are used as input:

$$X_i = N_{il}^{TTI}$$

$$e_{ini} = 1$$

$$e_{plus} = a \cdot N_{max}$$

$$e_{minus} = a \cdot \left|\Delta N_i\right|$$

Puncturing if $\Delta N_i < 0$, repetition otherwise. The values of $\Delta N_{i,l}^{TTI}$ may be computed by counting repetitions or puncturing when the algorithm of section 4.2.7.5 is run. The resulting values of $\underline{\Delta N_{i,l}^{TTI}}$ can be represented with following expression.

$$\Delta N_{i,l}^{TTI} = \left\lceil \frac{\left|\Delta N_{max}\right| \times X_i}{N_{max}} \right\rceil \times \text{sgn}(\Delta N_{max})$$

4.2.7.2.1.2 Turbo encoded TrCHs

If repetition is to be performed on turbo encoded TrCHs, i.e. $\Delta N_{max} > 0$, the parameters in section 4.2.7.2.1.1 are used.

If puncturing is to be performed, the parameters below shall be used. Index b is used to indicate systematic (b=1), 1st parity (b=2), and 2nd parity bit (b=3).

    $a=2$ when $b=2$

    $a=1$ when $b=3$

The bits indicated by b=1 shall not be punctured.

$$\Delta N_i = \begin{cases} \left\lfloor \Delta N_{max}/2 \right\rfloor, & b = 2 \\ \left\lceil \Delta N_{max}/2 \right\rceil, & b = 3 \end{cases}$$

$$N_{max} = \max_{l \in TFS(i)} (N_{il}^{TTI} / 3)$$

For each transmission time interval of TrCH i with TF l, the rate-matching pattern is calculated with the algorithm in section 4.2.7.5. The following parameters are used as input:

$$X_i = N_{il}^{TTI} / 3$$

$$e_{ini} = N_{max}$$

$$e_{plus} = a \cdot N_{max}$$

$$e_{minus} = a \cdot \left| \Delta N_i \right|$$

The values of $\Delta N_{i,l}^{TTI}$ may be computed by counting ~~repetitions or~~ puncturing when the algorithm of section 4.2.7.5 is run. The resulting values of $\Delta N_{i,l}^{TTI}$ can be represented with following expression..

$$\Delta N_{i,l}^{TTI} = -\left\lfloor \frac{\left| \left\lfloor \Delta N_{max} / 2 \right\rfloor \right| \times X_i}{N_{max}} + 0.5 \right\rfloor - \left\lfloor \frac{\left| \left\lceil \Delta N_{max} / 2 \right\rceil \right| \times X_i}{N_{max}} \right\rfloor$$

In the above equation, the first term of the right hand side represents the amount of puncturing for b=2 and the second term represents the amount of puncturing for b=3.