Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	Proposed text change on Link-to-System Mapping for P802.16m Evaluation Methodology Document
Date Submitted	**2007-07-09**
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Re:	IEEE 802.16m-07/023 Call for Comments on Draft 802.16m Evaluation Methodology Document
Abstract	This document proposes text modifications for 802.16m evaluation methodology (802.16m-07/080r2) regarding link-to-system mapping with repeated bits/symbols in HARQ
Purpose	For discussion and approval by TGm
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Proposed text change on Link-to-System Mapping for P802.16m Evaluation Methodology Document

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Introduction

This contribution revises the Exponential Effective SNR Mapping (EESM) formula in H-ARQ scenarios. In the case of repeated bits/symbols in Section 4.7.3, the RBIR for each H-ARQ retransmission is derived in eqn. (23) to address both CC and IR. More general and accurate description is provided where the transmitted bit sequence comprises of three types of bits, i.e., the set of newly coded bits with size N_{NR}, the set of repeated coded bits with size N_R, and the set of bits not repeated with size N_{pre}. However, the derivation of EESM does not take into account the IR scenario. The updated derivation is given in the following.

Proposed text change in section 4.7.3

In the case of EESM as a PHY abstraction method, the effective SINR for *k*th transmission can be calculated as follows:

~~$$SINR_{eff}^{1} = -\beta \ln\left(\frac{1}{|U_1|}\sum_{n\in U_1}\exp\left(-SINR_{n,1}/\beta\right)\right)$$~~

~~$$SINR_{eff}^{k} = \beta \ln\left(\frac{1}{|U_k|}\left(|U_{k-1}|\sum_{n\in U_{k-1}}\exp\left(\frac{1}{\beta}\left(SINR_{eff}^{k-1} + I_{n,k}SINR_{n,k}\right)\right) + \sum_{n\in V_k\setminus U_{k-1}}\exp\left(SINR_{n,k}/\beta\right)\right)\right)$$~~

~~where $SINR_{eff}^{k}$ is k-th transmission's effective SINR, $SINR_{n,k}$ is kth transmission's post processed SINR for bit index n, V_k is the set of indices where a coded bit was transmitted on k-th transmission, $I_{n,k}$ is an indicator function for codeword bit index i for the set V_k, ($I_{n,k}$ = 0 for $i \notin V_k$, and $I_{n,k}$ = 1 for $i \in V_k$), and U_k is the unique bit indices transmitted up to transmission k, $U_k = \bigcup_{j=1}^{k} V_j$~~

$$SINR_{eff}^{new} = -\beta \ln\left\{\frac{\sum_{n\in\Omega_{pre}}\exp\left(-\frac{SINR_{eff}^{old}}{\beta}\right) + \sum_{n\in\Omega_{NR}}\exp\left(-\frac{SINR_{n,k}}{\beta}\right) + \sum_{n\in\Omega_{R}}\exp\left(-\frac{SINR_{eff}^{old} + SINR_{n,k}}{\beta}\right)}{N_{pre} + N_{NR} + N_{R}}\right\}$$

where Ω_{pre}, Ω_R, and Ω_{NR} denote the sets of not re-transmitted bits, repeated transmission bits and newly coded bits, respectively. When the bits are transmitted in the first time, it is assumed that all bits are regarded as newly decoded bits. We then have $\Omega_R = \varnothing$, and $\Omega_{pre} = \varnothing$, i.e., N_R=0 and N_{pre}=0.