Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	**Text Modification for Draft 802.16m Evaluation Methodology Document: 4. Link-to-System Mapping**
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Re:	IEEE 802.16m-07/023– Call for Comments on Draft 802.16m Evaluation Methodology Document
Abstract	This contribution proposes to add the subsection to the Section ‘4.5. Per-tone SINR Computation’ for supporting simulation assumptions in the Section 2.2.
Purpose	For discussion and approval by TGm
Notice	
Release	
Patent Policy	

Text Modification on Section 4 Link-to-System Mapping

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I. Introduction

This contribution proposes text to Section 4 in the evaluation methodology document IEEE C802.16m-07/080r2.

In the Section 2.2 simulation assumptions, MIMO 2x2 (Matrix A & Matrix B) is specified as one of the baseline system assumption for the multi-antenna transmission format in downlink. However, the Section 4 only suggests the per-tone SINR description about Matrix B (MIMO multiplexing with the MMSE receiver) and does not include the description about Matrix A.

Therefore, we are proposing to add the subsection about the per-tone post processing SINR for STBC (Matrix A) in front of the Subsection 4.5.1.

II. Proposed Text for Section on *Per-tone SINR Computation*

---Start of the text---

[*Add the following text after the line#21 of the page62 in C802.16m-07/080r2*]

4.5.2. Per-tone Post Processing SINR for MIMO STBC

In order to obtain the per tone post processing SINR for the MIMO STBC (matrix A), we consider a 2 transmit and N_R receive antennas system. The transmission scheme for Interferers is also assumed the STBC. The received signal at the *n*-th subcarrier in the 1st and the 2nd STBC symbol interval are expressed as

$$
\begin{aligned}
Y_r^{(0)}(n,0) &= \sqrt{\frac{P_{tx}^{(0)}P_{loss}^{(0)}}{2}}\left(H_{0,r}^{(0)}(n)X^{(0)}(n,0) - H_{1,r}^{(0)}(n)X^{(0)}(n,1)^*\right) + \\
&\quad \sum_{j=1}^{N_I}\sqrt{\frac{P_{tx}^{(j)}P_{loss}^{(j)}}{2}}\left(G_{0,r}^{(j)}(n)X^{(j)}(n,0) - G_{1,r}^{(j)}(n)X^{(j)}(n,1)^*\right) + U_r^{(0)}(n,0)\,, \\
Y_r^{(0)}(n,1) &= \sqrt{\frac{P_{tx}^{(0)}P_{loss}^{(0)}}{2}}\left(H_{0,r}^{(0)}(n)X^{(0)}(n,1) + H_{1,r}^{(0)}(n)X^{(0)}(n,0)^*\right) + \\
&\quad \sum_{j=1}^{N_I}\sqrt{\frac{P_{tx}^{(j)}P_{loss}^{(j)}}{2}}\left(G_{0,r}^{(j)}(n)X^{(j)}(n,1) + G_{1,r}^{(j)}(n)X^{(j)}(n,0)^*\right) + U_r^{(0)}(n,1)\,,
\end{aligned}
\qquad (x)
$$

where

r is the received antenna index,

$Y_r^{(0)}(n,i)$ is the received signal in the i-th STBC symbol interval for the target user, $i=0,1$,

$X^{(j)}(n,i)$ is the transmitted symbol in the i-th STBC symbol interval, $i=0,1$,

$H_{t,r}^{(0)}(n)$ is the channel gain between the t-th transmit and the r-th receive antenna, $t=0,1$,

$U_r^{(0)}(n,i)$ is the receiver thermal noise in the i-th STBC symbol interval, $i=0,1$.

The 1st and the 2nd STBC symbols are obtained through the following processes as

$$\hat{X}^{(0)}(n,0)=\sum_{r=0}^{N_R-1}\left(H_{0,r}^{(0)*}(n)Y_r^{(0)}(n,0)+H_{1,r}^{(0)}(n)Y_r^{(0)}(n,1)^*\right),$$
$$\hat{X}^{(0)}(n,1)=\sum_{r=0}^{N_R-1}\left(-H_{1,r}^{(0)}(n)Y_r^{(0)}(n,0)^*+H_{0,r}^{(0)}(n)^*Y_r^{(0)}(n,1)\right). \quad \text{(y)}$$

After decoding process of STBC, the post-processing SINR of the desired user for the n-th subcarrier is given as

$$SINR^{(0)}(n)=$$
$$\frac{\dfrac{P_{tx}^{(0)}P_{loss}^{(0)}}{2}\left(\sum_{t=0}^{N_T-1}\sum_{r=0}^{N_R-1}\left|H_{t,r}^{(0)}(n)\right|^2\right)^2}{\left(\sum_{t=0}^{N_T-1}\sum_{r=0}^{N_R-1}\left|H_{t,r}^{(0)}(n)\right|^2\right)\sigma^2+\sum_{j=1}^{N_I}\dfrac{P_{tx}^{(j)}P_{loss}^{(j)}}{2}\left(\left|\sum_{t=0}^{N_T-1}\sum_{r=0}^{N_R-1}H_{t,r}^{(0)}(n)^*G_{t,r}^{(j)}(n)\right|^2+\left|\sum_{r=0}^{N_R-1}H_{1,r}^{(0)}(n)H_{0,r}^{(j)}(n)^*-H_{0,r}^{(0)}(n)^*G_{1,r}^{(j)}(n)\right|^2\right)}. \quad \text{(z)}$$

Note that post-processing SINR for the 1st STBC symbol is the same as that for the 2nd STBC symbol and the equation above is expressed based on the 1st STBC symbol.

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