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| Re: | Response to Sponsor Ballot on IEEE802.16e/D8 document |
| Abstract | In this contribution, we propose a simplified version of CINR measurement method based on EESM |
| Purpose | To incorporate the text changes proposed in this contribution into the 802.16e/D8 draft. |
| Notice |  |
| Release |  |

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# A simplified CINR Measurement using EESM method

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## Overview

In contribution C802.16e-05/141r3 [1], an EESM based CINR measurement technique has proposed to estimate effective CINR. Several scenarios have been studied. One problem associated with this method is its complexity. In this contribution, we propose a simplified version of the EESM method, outlined as follows.

From [1], the effective CINR is defined as

$$_{eff} \quad \ln \frac{1}{N} \sum_{i=1}^{N} \exp \quad \frac{i}{} \qquad (1)$$

As the number of sub-carreri $N$ is large, as in the case where this is used unto preamble, the argument of the above expression can be approximated by its mean by invoking the large number theorem. Furthermore, we can approximate the mean by

$$\exp \quad \int f( )d \qquad (2)$$

In a wideband system where multiplaths are rich and NLOS, we can regard the instantaneous CINR follows the independent Rayleigh fading. In this case, the pdf of is given as

$$f( ) \quad \frac{1}{} \exp \quad , \qquad (3)$$

where $\bar{}$ is the average CINR over all the relevant sub-carriers. Hence, we can compute the effective CINR $_{eff}$ as

$$_{eff} \quad \ln \frac{}{} . \qquad (4)$$

Notice that this calculation can be done in either SS or BS. In the latter case, all the SS needs to report to BS is still the average CINR, $\bar{}$, like before.

## Detailed Text Changes

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Reference

[1] IEEE C802.16e-05/141r3 CINR measurements using the EESM method (Ran Yaniv, Danny Stopler,

Tal Kaitz, Kfir Blum, Kevin Baum, Yufei Blankenship, Brian Classon, Mark Cudak Philippe Sartori, 2005-04-29)