Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	**Open loop uplink power control for 802.16m**
Date Submitted	**2009-03-02**
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Re:	Call for Contributions on Amendment Working Document Text
Abstract	This contribution proposes open loop power control text for the AWD
Purpose	To be discussed and agreed by TGm
Notice	
Release	
Patent Policy	

Open loop uplink power control for 802.16m in TDD

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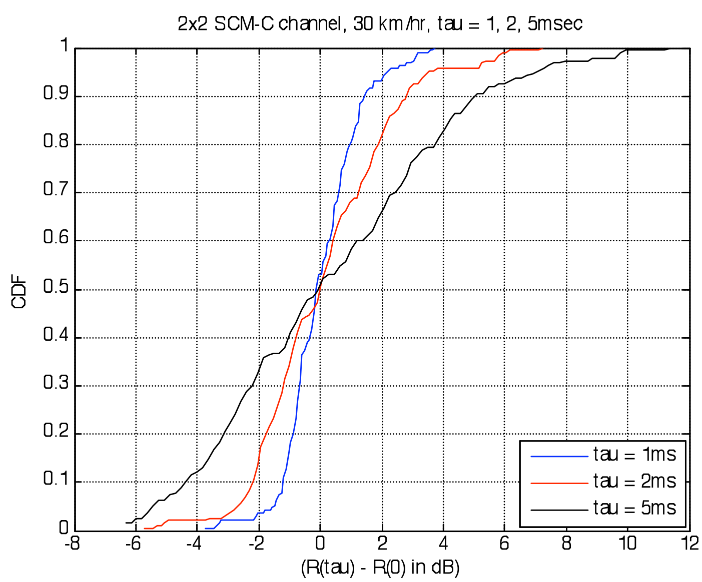
Introduction

Open loop power control is an important uplink power control mode that allows the AMS to compensate for channel variation and implementation loss without frequently interacting with the ABS [1, sect. 11].

Determining the correct compensation for path loss is a tradeoff between the goal of compensating for channel fluctuations and the competing goal of preventing fluctuating inter-cell interference. It is for that reason that an average path loss measurement is used for uplink power control. The averaging period should depend on the duplex mode (TDD, FDD), AMS speed, channel type and should be optimized for both link performance and inter-cell interference.

Specifically for TDD mode, the averaging period could depend on the elapsed time from the latest available preamble to the uplink transmission and AMS speed. Examining a typical 2x2 channel we can see that even for medium speed mobiles, if that time is short enough then the path loss is very likely to stay within ±1dB from its last measurement. The same isn't true when the elapsed time approaches 5ms where a significant probability (20%) exists for exceeding ±4dB.

Therefore we propose that the time of the uplink allocation is taken into account in the measured path loss. The text proposal is based on the rev-2 OLPC with the above changes.



References

[1] SDD 003r7

Text Proposal

[Insert the following text in the appropriate location]

Open-loop power control

In open-loop power control , the power per a subcarrier shall be maintained for the UL transmission as follows. This open-loop power control shall be applied for the all UL bursts. See Equation (1).

$$P(\text{dBm}) = W*L + (1 - W)*L' + C/N + NI - 10\log_{10}(R) + \text{Offset\_SS}_{\text{perSS}} + \text{Offset\_BS}_{\text{perBS}} \quad (1)$$

where

- ***P*** is the TX power level (dBm) per a subcarrier for the current transmission, including MS Tx antenna gain.
- ***L*** is the estimated average current UL propagation loss. It shall include SS Tx antenna gain and path loss, but exclude the BS Rx antenna gain.
- ***L'*** is the instantaneous propagation loss obtained from the last available preamble.
- ***W*** is determined by time/distance of the preamble to the UL allocation, exact mechanism is FFS.
- ***C/N*** is the normalized *C/N* of the modulation/FEC rate for the current transmission
- ***R*** is the number of repetitions for the modulation/FEC rate.
- ***NI*** is the estimated average power level (dBm) of the noise and interference per a subcarrier at BS, not including BS Rx antenna gain.
- ***Offset_SS**perSS* is the correction term for SS-specific power offset. It is controlled by SS. Its initial value is zero.
- ***Offset_BS**perSS* is the correction term for SS-specific power offset. It is controlled by BS with power con-trol messages. When Offset_BSperSS is set through the PMC_RSP message, it shall include BS Rx antenna gain.

The estimated average current UL propagation loss, *L*, shall be calculated based on the total power received on the active subcarriers of the frame preamble, and with reference to the BS_EIRP parameter sent by the BS.

The default normalized *C/N* values per modulation are given in (TBD). The operating parameters BS_EIRP is signaled by (TBD).