

Uplink Power Control in the Base Station

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Re:

IEEE 802.16m-08/024: Call for Contributions on Project 802.16m System Description Document (SDD) (2008-06-18), Power Control.

Abstract:

Discussion on interference mitigation for uplink of IEEE 802.16m SDD

Purpose:

Adoption of proposed text into SDD

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Rationale

- Total throughput is increased as intercell interference is reduced.
- Thus, an uplink power control method covering users in the cell edge is required.

Uplink Power Control with Loading Factor

- Loading factor
 - $\frac{\text{the number of used subcarriers in the monitoring sector } i}{\text{the number of total subcarriers}}$
- For example,
 - Sector i in BS_1 has intercell interference by MS_0 connected to BS_0 .
 - BS_1 transmits the average loading factor of the $(n-1)$ -th frame to BS_0 .
 - According to the value of loading factor, the power of MS_0 in the (n) -th frame is reduced or increased.

Uplink Power Control with Loading Factor (Cont'd)

- Thus,

- $P_{MS} = P_{OLPC \text{ or } CLPC} + \Delta P$

- , where

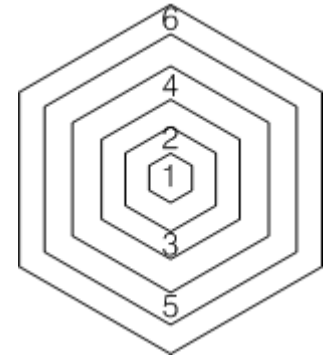
- $P_{OLPC \text{ or } CLPC}$: open loop power control or closed loop power control in the legacy system

- ΔP : power control by loading factor

Simulation Results

- Throughput per zone

Zone	w/o power control	Open loop power control	Loading factor power control
1	1.176	1.457	1.518
2	1.139	1.343	1.444
3	1.050	1.331	1.472
4	0.917	1.272	1.355
5	0.884	1.059	1.221
6	0.740	0.819	1.228



- Total throughput

w/o power control	Open loop power control	Loading factor power control
1.515	1.817	2.132

Proposed Texts into SDD

- 11.x. Uplink Power Control
 - *Power control adjusted by the base station should be supported. Also, power control using the information of neighbor cells should be supported.*