

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	Uplink MU-MIMO scheme for multiple transmit antennas	
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Re:	IEEE 802.16m-08/016r1: Call for Contributions on Project 802.16m System Description Document (SDD) (2008-03-20), Uplink MIMO schemes.	
Abstract	In order to improve spectral efficiency, this contribution proposes network coordinated beamforming focusing on downlink dedicated/control channels.	
Purpose	Adoption of proposed text into SDD	
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Introduction

- ▣ **Requirements of advanced mobiles for uplink**
 - Higher data rates
 - Diversity gain/SNR gain
 - Feasible low power consumption

- ▣ **Multiple antenna mobiles**
 - Multiple antennas(multiple RF chains) schemes are indispensable approach for the requirements
 - Beamforming/Diversity/Spatial Multiplexing

Uplink MU-MIMO

- **Single antenna CSM**
 - Efficient technique increasing throughput
 - Suitable for low cost/compact mobiles

- **Multiple antenna MU-MIMO**
 - Multiple antennas(multiple RF chains) are used to increase peak user rate or diversity gain in 16e.
 - Beamforming(Effective single antenna) can be used for MU-MIMO.

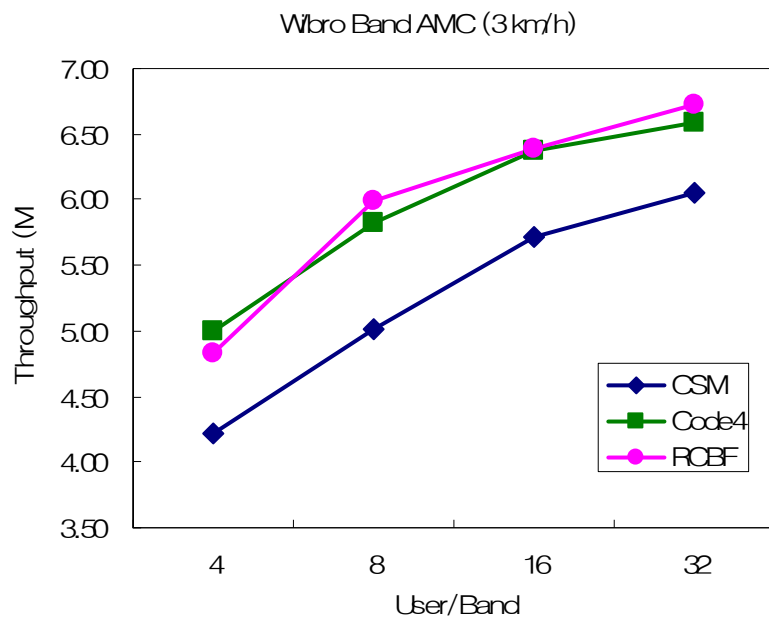
Simulation conditions

■ Simulation conditions

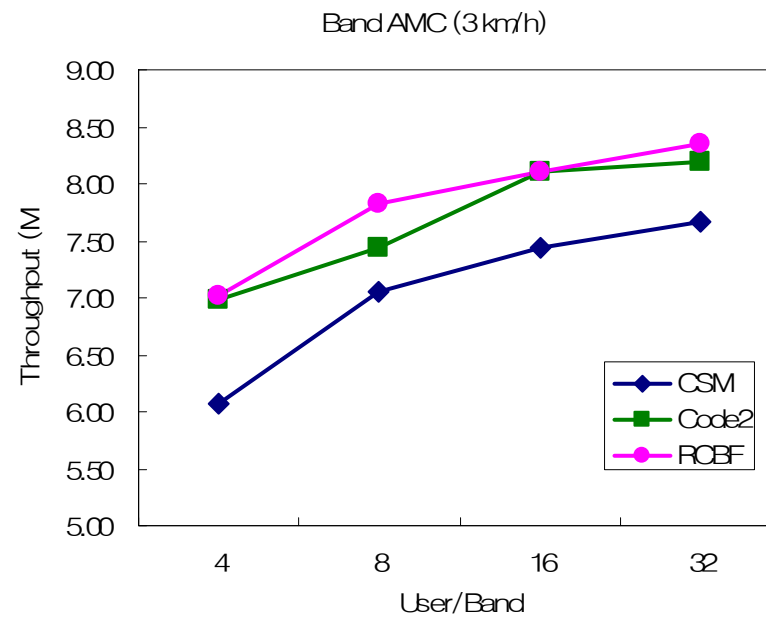
- 19 cell, 3 sector
- No Power control
- 8 band/10MHz
- 3GPP SCM channel/Suburban Macro
- PF scheduling per band
- MMSE receiver
- # of basestation Rx ant. => 2 (antenna spacing 0.5 lambda)
- # of mobilestation Tx antennas => 2 (antenna spacing 0.5 lambda)
- CSM (1 Tx Ant) vs. Codebook (2 Tx. Ant. 1 unitary matrix used)

Simulations Results

Basestation - 2Rx Antenna



Basestation - 4Rx Antenna



Text Proposal

11.X Uplink MIMO schemes

For mobilestations with multiple Tx antennas (RF chains), transmit beamforming schemes are adopted to increase system throughput.

References

- [1] IEEE 802.16m-07/002r4, "TGm System Requirements Document (SRD)"
- [2] IEEE 802.16m-08/003r1, "Draft IEEE 802.16m System Description Document"
- [3] IEEE 802.16m-08/004r1, "TGm Evaluation Methodology Document"
- [4 [5] IEEE P802.16Rev2/D3