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Project	**IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>**
Title	**MIMO Strategies for the IEEE 802.16m Uplink**
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Re:	TGm Call for Contributions on Project 802.16m System Description Document (SDD), IEEE 802.16m-08/024 Topic: Uplink MIMO Schemes
Abstract	This contribution proposes text for the SDD on uplink MIMO schemes
Purpose	Discussion and adoption of SDD text
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Proposed text for UL MIMO Schemes in the SDD:

Contents

11.8 Uplink MIMO Transmission Schemes

The uplink shall support several MIMO transmission schemes for providing improved uplink capacity and reliability over the legacy system.

11.8.1   MS antenna configurations supported for UL MIMO

- Mobile Handset/CPE: 1 transmit antenna, 2 receive antennas
- Switched Diversity MS/CPE: 1 transmit antenna, M receive antennas
- Mid-Tier CPE: 2 transmit antennas, M receive antennas
- High-Tier CPE: 4 transmit antennas, M receive antennas (FFS)

11.8.2   Single User Transmission Methods

SIMO: The uplink shall support SIMO (single transmit, multiple receive) and SIMO with switched transmit diversity. The signaling required to support switched transmit diversity is FFS.

Space-Time Block Coding (STBC) / Space-Frequency Block Coding (SFBC): The uplink shall support two-transmit antenna STBC/SFBC (e.g., the two-antenna Matrix A methodology from the legacy system). The exact mapping of the STBC/SFBC to the uplink allocation is FFS.

Open-Loop MIMO: The uplink shall support two-transmit antenna open-loop MIMO that is vertically encoded (single-codeword) (e.g., the two-antenna Matrix B methodology from the legacy system).

11.8.3   Multi-User Transmission methods

Collaborative spatial multiplexing of up to four spatial layers shall be supported on the uplink. A pilot format that supports channel estimation for up to four transmit layers or antennas shall be used on the uplink. Up to four MSs can share the maximum four layers of the uplink. Collaborative spatial multiplexing with MSs having two transmit antennas may be used in conjunction with STC or MIMO transmission schemes. Collaborative spatial multiplexing of single- and two-antenna MSs shall be supported, where a single-antenna MS occupies one of the uplink layers of the pilot format, and a two-antenna MS occupies two of the layers of the pilot format. The following cases are supported:

- Up to four single-antenna MSs can be multiplexed in one uplink allocation.

- Two two-antenna MSs can be multiplexed in one uplink allocation where each two-antenna MS employs two-antenna open-loop STC or two-antenna open-loop single-codeword MIMO.

- One two-antenna MS and one or two single antenna MSs and can be multiplexed, where the two-antenna MS employs two-antenna STC or two-antenna open-loop MIMO.