

Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >		
Title	<b>Layer to Stream and Stream to Antenna Mapping in DL MIMO</b>		
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Re:	IEEE 802.16m-08/052, Call for Comments on Project 802.16m System Description Document (SDD), Section 11.8.1		
Abstract	Proposed text changes for the sections on layer to stream and stream to antenna mapping in the DL MIMO section of the SDD		
Purpose	Discuss and adopt the proposed text changes to the SDD		
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# Layer to Stream and Stream to Antenna Mapping in UL MIMO

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## Comment

The application of the STC matrix  $\mathbf{S}(\mathbf{x})$  is not part of the stream to antenna mapping but of the layer to stream mapping.

## Solution

Add in section “11.8.1.2 Layer to Stream Mapping” an equation describing the layer to stream mapping and remove the STC matrix from the equation in section “11.8.1.3 Stream to Antenna Mapping”.

## Proposed Text Changes

-----start of old text -----

### 11.8.1.2 Layer to Stream Mapping

For open-loop spatial multiplexing and closed-loop SU-MIMO, the number of streams is  $N_s \leq \min(N_T, N_R)$ , where  $N_s$  is no more than 8. For open-loop transmit diversity modes,  $N_s$  depends on the STC schemes employed by the MIMO encoder. MU-MIMO can have up to 2 streams with 2 Tx antennas, and up to 4 streams for 4 Tx antennas and 8 Tx antennas.

For SU-MIMO, spatial multiplexing MIMO mode employs vertical encoding (SCW). [The support of horizontal encoding (MCW) for SU-MIMO spatial multiplexing MIMO mode is FFS]. For SU-MIMO, transmit diversity MIMO mode employs vertical encoding (SCW). For MU-MIMO, MCW (or horizontal) encoding is employed at the base-station while only one stream is transmitted to each mobile station.

### 11.8.1.3 Stream to Antenna Mapping

The stream to antenna mapping depends on the MIMO scheme used. The mapping can be defined using the following equation

$$\mathbf{y} = \mathbf{P} \times \mathbf{S}(\mathbf{x}), \text{ Equation 1}$$

where  $\mathbf{y}$  is the output of the precoder/beamformer,  $\mathbf{P}$  is a pre-coding matrix,  $\mathbf{S}(\mathbf{x})$  is an STC matrix, and  $\mathbf{x}$  is the input layer vector.

-----end of old text -----

-----start of new text -----

### 11.8.1.2 Layer to Stream Mapping

For open-loop spatial multiplexing and closed-loop SU-MIMO, the number of streams is  $N_s \leq \min(N_T, N_R)$ , where  $N_s$  is no more than 8. For open-loop transmit diversity modes,  $N_s$  depends on the STC schemes employed by the MIMO encoder. MU-MIMO can have up to 2 streams with 2 Tx antennas, and up to 4 streams for 4 Tx antennas and 8 Tx antennas.

For SU-MIMO, spatial multiplexing MIMO mode employs vertical encoding (SCW). [The support of horizontal encoding (MCW) for SU-MIMO spatial multiplexing MIMO mode is FFS]. For SU-MIMO, transmit diversity MIMO mode employs vertical encoding (SCW). For MU-MIMO, MCW (or horizontal) encoding is employed at the base-station while only one stream is transmitted to each mobile station.

The layer to stream mapping depends on the MIMO scheme used. The mapping can be defined using the following equation

$$\mathbf{z} = \mathbf{S}(\mathbf{x}), \text{ Equation 1a}$$

where  $\mathbf{z}$  is the output of the MIMO encoder,  $\mathbf{S}(\mathbf{x})$  is an STC matrix, and  $\mathbf{x}$  is the input layer vector.

### 11.8.1.3 Stream to Antenna Mapping

The stream to antenna mapping depends on the MIMO scheme used. The mapping can be defined using the following equation

$$\mathbf{y} = \mathbf{P} \times \mathbf{z}, \text{ Equation 1b}$$

where  $\mathbf{y}$  is the output of the precoder/beamformer,  $\mathbf{P}$  is a pre-coding matrix,  ~~$\mathbf{S}(\mathbf{x})$  is an STC matrix, and  $\mathbf{x}$  is the input layer vector~~ and  $\mathbf{z}$  is the output of the MIMO encoder.

-----end of new text -----