Title: Modification of Open loop STC

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Abstract: Modification of the open loop STC for 3, 4 Tx

Purpose: Adoption of proposed changes into P802.16e

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Modification of Open loop STC

1. Specific Text Changes

[Replace the section 8.4.8.3.5 as follows]

8.4.8.3.5 Transmission schemes for 4-antenna BS

The proposed Space-Time Frequency code (over two OFDMA symbols and two subcarriers) for 4Tx-Rate 1 configuration with diversity order 4 is given in three permuted versions:

\[ A_1 = \begin{bmatrix} S_1 & -S^*_2 & 0 & 0 \\ S_2 & S^*_1 & 0 & 0 \\ 0 & 0 & S_3 & -S^*_4 \\ 0 & 0 & S_4 & S^*_3 \end{bmatrix} \quad A_2 = \begin{bmatrix} S_1 & -S^*_2 & 0 & 0 \\ 0 & 0 & S_3 & -S^*_4 \\ S_2 & S^*_1 & 0 & 0 \\ 0 & 0 & S_4 & S^*_3 \end{bmatrix} \quad A_3 = \begin{bmatrix} S_1 & -S^*_2 & 0 & 0 \\ 0 & 0 & S_3 & -S^*_4 \\ 0 & 0 & S_4 & S^*_3 \\ S_2 & S^*_1 & 0 & 0 \end{bmatrix} \]

The choice of subscript \( k \) to determine the matrix \( A_k \) is given by the following formula:

\[ k = \text{mod}\left(\text{floor}\left(\text{logical data sub-carrier number for first tone of code}/2\right), 3\right) + 1. \]

where:
- logical data sub-carrier number for first tone of code = 1,2,3,...,Total # of data sub-carriers

For all optional permutation zones using 4-antenna BS, one of the following three transmission matrices shall be used:

\[ A = \begin{bmatrix} s_1 & -s_2 & 0 & 0 \\ s_2 & s_1 & 0 & 0 \\ 0 & 0 & s_3 & -s_4 \\ 0 & 0 & s_4 & s_3 \end{bmatrix} \]

\[ B = \begin{bmatrix} \ast & \ast & -s_7 & -s_8 \\ -s_2 & s_1 & s_6 & s_8 \\ s_3 & -s_4 & s_7 & s_5 \\ s_4 & s_3 & s_8 & s_6 \end{bmatrix} \]
The permuted matrix-A (over two OFDMA symbols and two subcarriers) for 4Tx-Rate 1 is given in three permuted matrices:

\[ A_1 = \begin{bmatrix} S_1 & -S^*_2 & 0 & 0 \\ S_2 & S^*_1 & 0 & 0 \\ 0 & 0 & S_3 & -S^*_4 \\ 0 & 0 & S_4 & S^*_3 \end{bmatrix}, \quad A_2 = \begin{bmatrix} S_1 & -S^*_2 & 0 & 0 \\ 0 & 0 & S_3 & -S^*_4 \\ S_2 & S^*_1 & 0 & 0 \\ 0 & 0 & S_4 & S^*_3 \end{bmatrix}, \quad A_3 = \begin{bmatrix} S_1 & -S^*_2 & 0 & 0 \\ 0 & 0 & S_3 & -S^*_4 \\ S_2 & S^*_1 & 0 & 0 \end{bmatrix}. \]

The mapping of subscript \( k \) to determine the matrix \( A_k \) is given by the following formula:

\[ k = \text{mod} (\text{floor}(\text{logical_data_sub_carrier_number_for_first_tone_of_code}-1/2),3)+1. \]

where:

\( \text{logical_data_sub_carrier_number_for_first_tone_of_code} = 1,2,3,\ldots,\text{Total # of data sub-carriers} \)

The permuted matrix-B (over two OFDMA symbols and two subcarriers) for 4Tx-Rate 2 is given in six permuted matrices:

\[ B_1 = \begin{bmatrix} S_1 & -S^*_2 & S_5 & -S^*_6 \\ S_2 & S^*_1 & S_6 & S^*_5 \\ S_3 & -S^*_4 & S_7 & -S^*_8 \\ S_4 & S^*_3 & S_8 & S^*_7 \end{bmatrix}, \quad B_2 = \begin{bmatrix} S_1 & -S^*_2 & S_5 & -S^*_6 \\ S_2 & S^*_1 & S_6 & S^*_5 \\ S_3 & -S^*_4 & S_7 & -S^*_8 \\ S_4 & S^*_3 & S_8 & S^*_7 \end{bmatrix}, \quad B_3 = \begin{bmatrix} S_1 & -S^*_2 & S_5 & -S^*_6 \\ S_3 & -S^*_4 & S_7 & -S^*_8 \\ S_2 & S^*_1 & S_6 & S^*_5 \end{bmatrix}, \quad B_4 = \begin{bmatrix} S_1 & -S^*_2 & S_5 & -S^*_6 \\ S_3 & -S^*_4 & S_7 & -S^*_8 \\ S_4 & S^*_3 & S_8 & S^*_7 \end{bmatrix}, \quad B_5 = \begin{bmatrix} S_1 & -S^*_2 & S_5 & -S^*_6 \\ S_4 & S^*_3 & S_8 & S^*_7 \\ S_2 & S^*_1 & S_6 & S^*_5 \end{bmatrix}, \quad B_6 = \begin{bmatrix} S_1 & -S^*_2 & S_5 & -S^*_6 \\ S_3 & -S^*_4 & S_7 & -S^*_8 \\ S_2 & S^*_1 & S_6 & S^*_5 \end{bmatrix}. \]

The mapping of subscript \( k \) to determine the matrix \( B_k \) is given by the following formula:

\[ k = \text{mod} (\text{floor}(\text{logical_data_sub_carrier_number_for_first_tone_of_code}-1/2),6)+1. \]

where:

\( \text{logical_data_sub_carrier_number_for_first_tone_of_code} = 1,2,3,\ldots,\text{Total # of data sub-carriers} \)

End text proposal
References: