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Abstract	Corrections and clarifications of definitions for STC in OFDMA PHY.
Purpose	Adopt changes.
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Simplification of downlink STC in PUSC

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1. Motivation

The definitions of STC coding for 2 antennas in downlink PUSC are overly complex, without any apparent reason. The definition by which data subcarriers are switched with pilots is difficult to understand and creates unnecessary complexity (a two layer permutation created by combintation of PUSC permutation and subcarrier switching in STC). In addition, in the current definition STC is done over slots, which inserts an unnecessary delay and sensitivity to phase noise, puts an unnecessary constraint of the length of the STC zone (STC zone is required to be a multiple of 4 symbols instead of 2 – waste of up to 2 symbols) and differentiates between STC for FUSC and for PUSC.

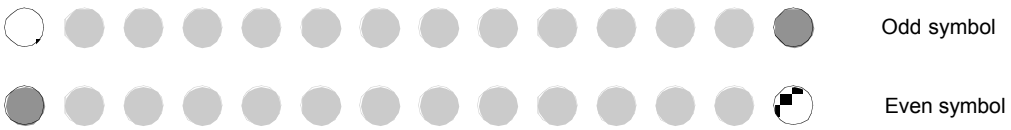
Currently for FUSC, the pilot locations in the permutation definition are changed in order to accommodate STC, and STC encoding/combining is done on two adjacent symbols.

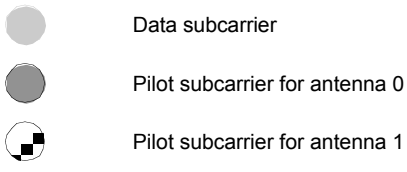
However in PUSC, the pilot locations in the permutation definition stay the same, but are then switched as part of the STC definition, and STC is done over two symbols. The switching was done in order to accommodate the fact that in the definition of STC the number of data subcarriers per cluster in odd and even symbols is not the same (the PUSC permutation is defined only for 12 data subcarriers per cluster per symbol). But a simpler definition is to use a constant number of data carriers per symbol and avoid the switching.

We propose to simplify the definitions by defining different pilot locations for PUSC, that will not necessitate subcarrier switching, and will make STC combining similar for PUSC and FUSC.

2. Details

We propose that for STC in PUSC the pilot locations in the cluster will be changed as follows:





In this way:

- The number of data subcarriers per cluster is constant, and therefore there is no need for additional switching between tones.

- The channel can be estimated from one cluster.
- STC combining can be done on the data subcarriers in two adjacent symbols (as in FUSC).

3. Changes summary

8.4.8.1.2.1.1 STC using 2 antennas in PUSC

[Replace the contents of the sub-section with the following text]

In PUSC the data allocation to cluster is changed (Figure 245) to accommodate two antennas transmission with the same estimation capabilities, each cluster shall be transmitted twice from each antenna.

Figure 245 replaces Figure 234 in the definition of PUSC permutation when STC is enabled.

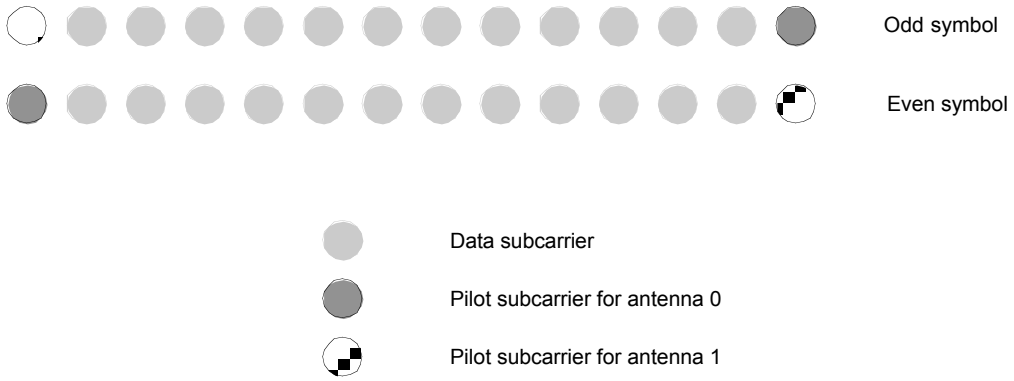


Figure 245 – Cluster structure for STC PUSC

STC encoding is performed on the two symbols of the PUSC slot (the even symbol with the odd symbol).