

Source: TSG RAN WG1

Title: Liaison Statement to TSG RAN WG2 on Transmit Diversity Issues

TSG-RAN Working Group1 has defined Transmit Diversity for FDD, which exists in a number of modes. These modes are selected according to the Physical Channel (PCCPCH, DPCH etc.), cell conditions and operator preferences. In particular, there is one so-called "Open-loop" mode (Space Time Transmit Diversity or STTD), and a number (3 or 4) of "Feedback" modes which require Layer 1 signalling from the UE to the Radio Access Point. The support of these schemes is optional in the network. STTD can be applied to common channels, with the possible exception of SCH.

Working group 1 has so far identified a number of signalling requirements and issues related to support of these transmit diversity modes which it would like to draw to the attention of WG2. Three types of mode selection have so far been identified by WG1:

1. Mode selection requiring no signalling. For example, the open-loop mode may be the default mode during SHO and for certain Common Channels.
2. Mode selection on a per-cell basis. The choice of whether or not to deploy Open-loop, and/or a preferred FB mode, is fixed for a particular cell. The mode used in a cell is an operators choice and is broadcast on the BCCH. For example, a particular FB mode may be selected for all Pico cells and some Microcells (cell specific).
3. Mode selection on a per-call basis. This approach is desirable in cells where different UEs may be experiencing different conditions of mobility or uplink signalling channel quality. It may be desirable to change modes during a call. The set of modes used in a cell is an operators choice and is broadcast on BCCH. Decisions are taken by the network. However, UEs may optionally request the use of a particular mode, or in the more general case inform the base about particular conditions such as channel variation rate, estimated feedback channel estimation quality, etc. This latter possibility requires further consideration.

Several issues have also been identified:

- A. Use of STTD on PCCPCH, given that transmit antenna diversity may or may not be present. WG1 has concluded that STTD can be applied to PCCPCH.
- B. BCCH signalling support is needed to identify if open-loop transmit diversity is deployed in the cell, and to identify which feedback mode(s) is/are supported, noting that transmit diversity is an optional feature in the network.
- C. Assuming that the mode for DCH is under the control of UTRAN, the following information should be exchanged between the UE and the UTRAN:
 - a) Optional reporting by the UE of particular conditions such as channel variation rate, or of a particular requested mode, in order to be used by the MAC in the UTRAN mode selection.

b) Indication by the UTRAN to the UE of the mode to be used.

WG1 would like to obtain the opinion of WG2 on these matters, particularly related to issues B and C. Note that this list only contains those issues so far identified in WG1 and should not be considered as exhaustive.