

Agenda item: R99
Source: InterDigital Comm. Corp.
Title: CR-25.224-051r1 "DPCH Transmit Diversity"
Document for: Decision

1 Introduction

For high data rate services it may be desirable to employ efficient receiver structures, having a lower computational complexity than JD receivers. One example is the Low Cost MMSE-BLE-SD Algorithm for UTRA TDD Mode Downlink presented in ETSI SMG2 Layer 1 Expert Group, Helsinki, September 1988. However this and similar receiver structures can properly operate if one of the following conditions hold:

1. No Tx diversity is applied in the cell.
2. If Tx diversity is applied to dedicated channels, there is only one user in the time slot.

To allow the UE to select the the proper receiver structure, UE DL transmit diversity indication by higher layers is needed.

2 Specific Changes

A text indicating that DL DPCH TX Diversity is indicated by higher layers is added.

CR-Formv3	
CHANGE REQUEST	
✎ 25.224 CR 52 ✎ rev 1 ✎ Current version: 3.5.0 ✎	

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ✎ symbols.

Proposed change affects: ✎ (U)SIM ME/UE Radio Access Network Core Network

Title:	✎ DPCH Transmit Diversity		
Source:	✎ InterDigital Comm. Corp.		
Work item code:	✎	Date:	✎ Feb 26, 2001
Category:	✎ F	Release:	✎ R99
	Use <u>one</u> of the following categories: F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		

Reason for change:	✎ For high data rate services it may be desirable to employ efficient receiver structures, having a lower computational complexity than JD receivers. One example is the Low Cost MMSE-BLE-SD Algorithm for UTRA TDD Mode Downlink presented in ETSI SMG2 Layer 1 Expert Group, Helsinki, September 1988. However this and similar receiver structures can properly operate if one of the following conditions hold: 1. No Tx diversity is applied in the cell. 2. If Tx diversity is applied to dedicated channels, there is only one user in the time slot. To allow the UE to select the proper receiver structure, UE DL transmit diversity indication by higher layers is needed.
Summary of change:	✎ DL DPCH Tx Diversity indicated by higher layers note added.
Consequences if not approved:	✎ . Degraded reception performance.

Clauses affected:	✎ 4.6.1	
Other specs affected:	✎ <input type="checkbox"/> Other core specifications ✎ 25.331 <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	

Other comments: ✍

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at:
http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ✍ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.6 Downlink Transmit Diversity

Downlink transmit diversity for DPCH, P-CCPCH, and SCH is optional in UTRAN. Its support is mandatory at the UE.

4.6.1 Transmit Diversity for DPCH

The transmitter structure to support transmit diversity for DPCH transmission is shown in figure 1. Channel coding, interleaving and spreading are done as in non-diversity mode. The spread complex valued signal is fed to both TX antenna branches, and weighted with antenna specific weight factors w_1 and w_2 . The weight factors are complex valued signals (i.e., $w = a + jb$), in general. These weight factors are calculated on a per slot and per user basis. The weight factors are determined by the UTRAN. Examples of transmit diversity schemes are given in annex B.

[The use of DPCH transmit diversity is indicated by higher layers.](#)

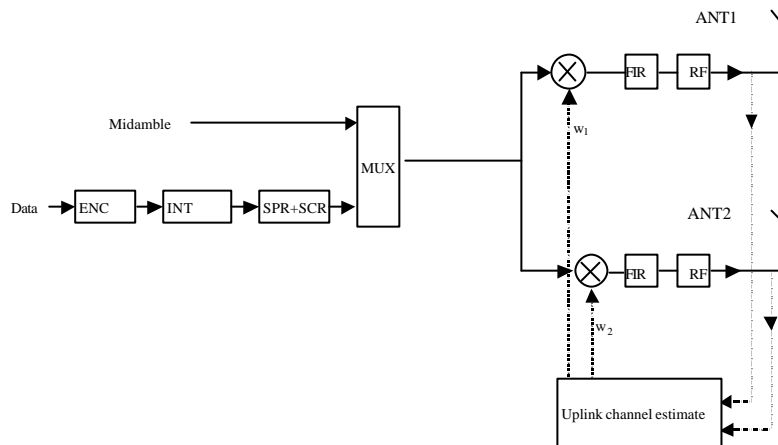


Figure 1: Downlink transmitter structure to support Transmit Diversity for DPCH transmission (UTRAN Access Point)