

Agenda Item: 8
Source: Siemens AG
Title: Proposal for changes in 25.302 according to PCH structure for TDD
Document for: Decision

1. Introduction

For TDD mode, RAN WG1 has adopted a new paging channel structure, similar to the structure for FDD presented in [2]. A concept for the use of DRX for TDD is presented in [4].

The new paging scheme requires some changes in the description of the UE model in TS 25.302, Services provided by the physical layer. This paper presents the necessary changes and contains a text proposal for TS25.302.

2. Summary

The only change needed in TS25.302 is in the section 6.1, Downlink models. In this section, the figure showing the “Model of the UE’s physical layer – downlink TDD mode” has to be changed to reflect the usage of one physical channel for both PCH and FACH, and to show the association of the Page Indicators (PI) to the PCH transport channel. Some text about the handling of BCH, PCH and FACH for TDD has also been changed, to be in line with the new structure of the paging channel.

In the further chapters of the TS 25.302, no changes are necessary.

3. Text Proposal

6.1 Downlink models

Figure 1 and Figure 2 show the model of the UE's physical layer for the downlink in FDD and TDD mode, respectively. Note that there is a different model for each transport channel type.

Editors note: Models for downlink transport channels currently marked ffs will be necessary if these channels are included in the description.

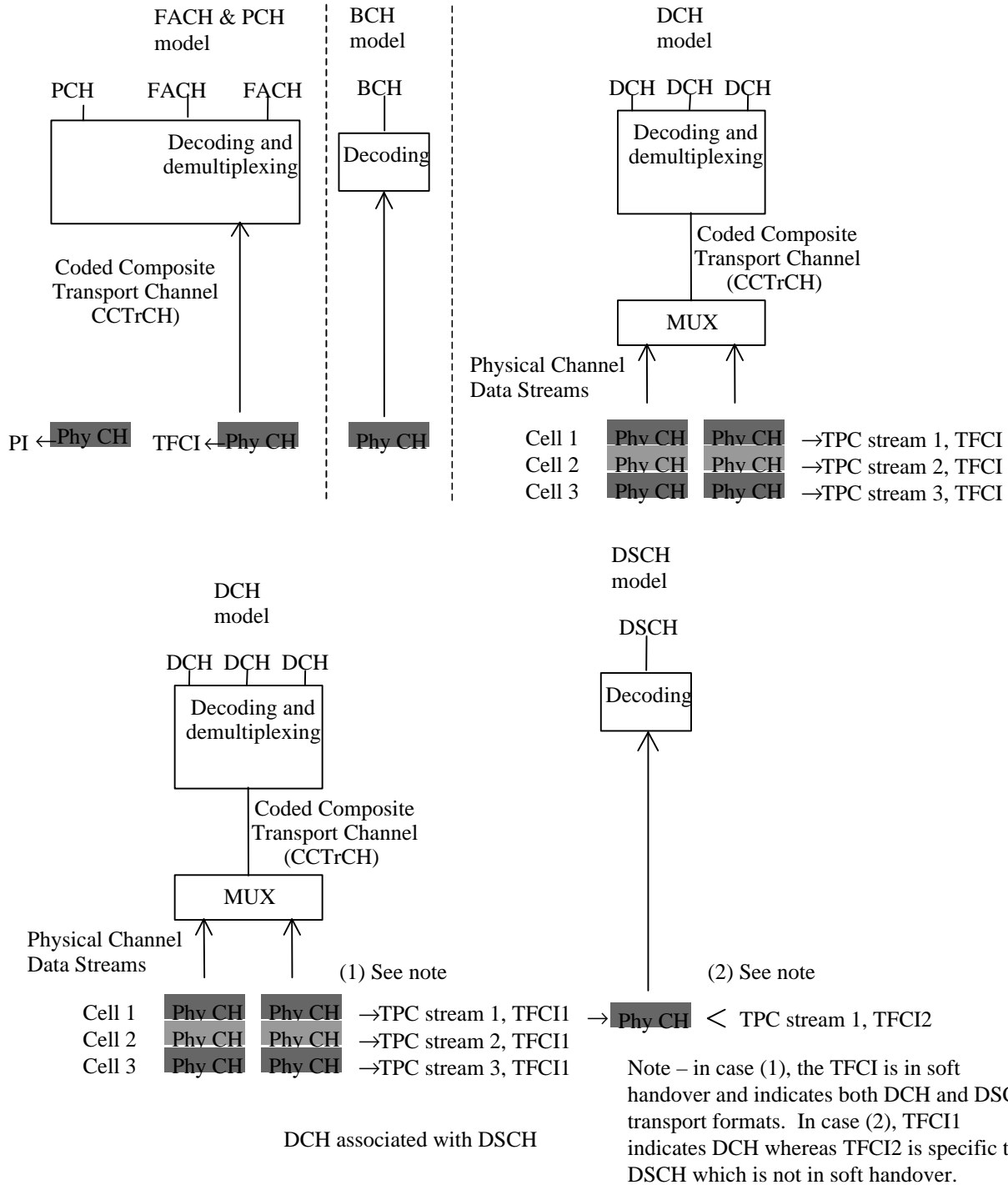
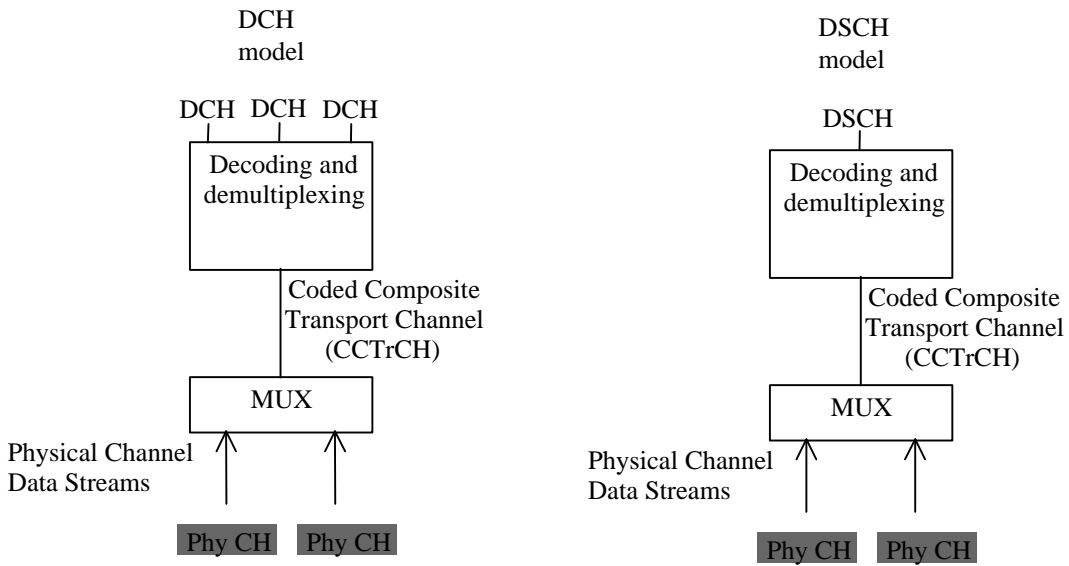
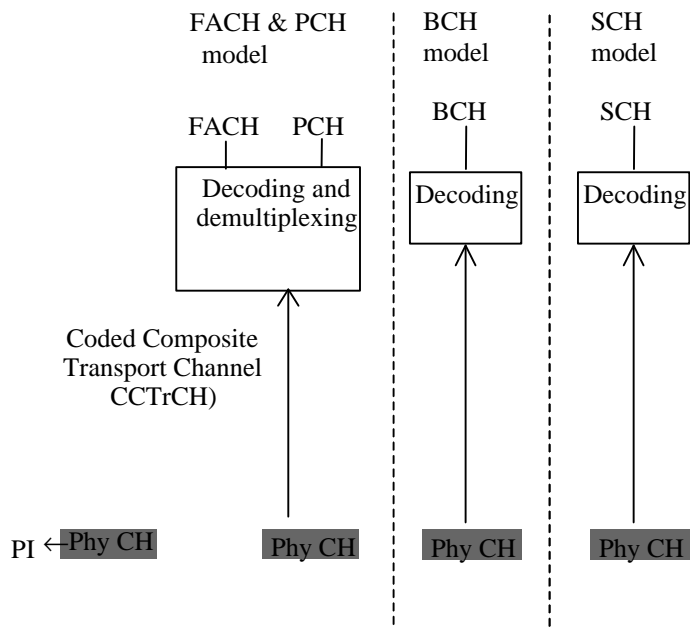


Figure 1: Model of the UE's physical layer – downlink FDD mode



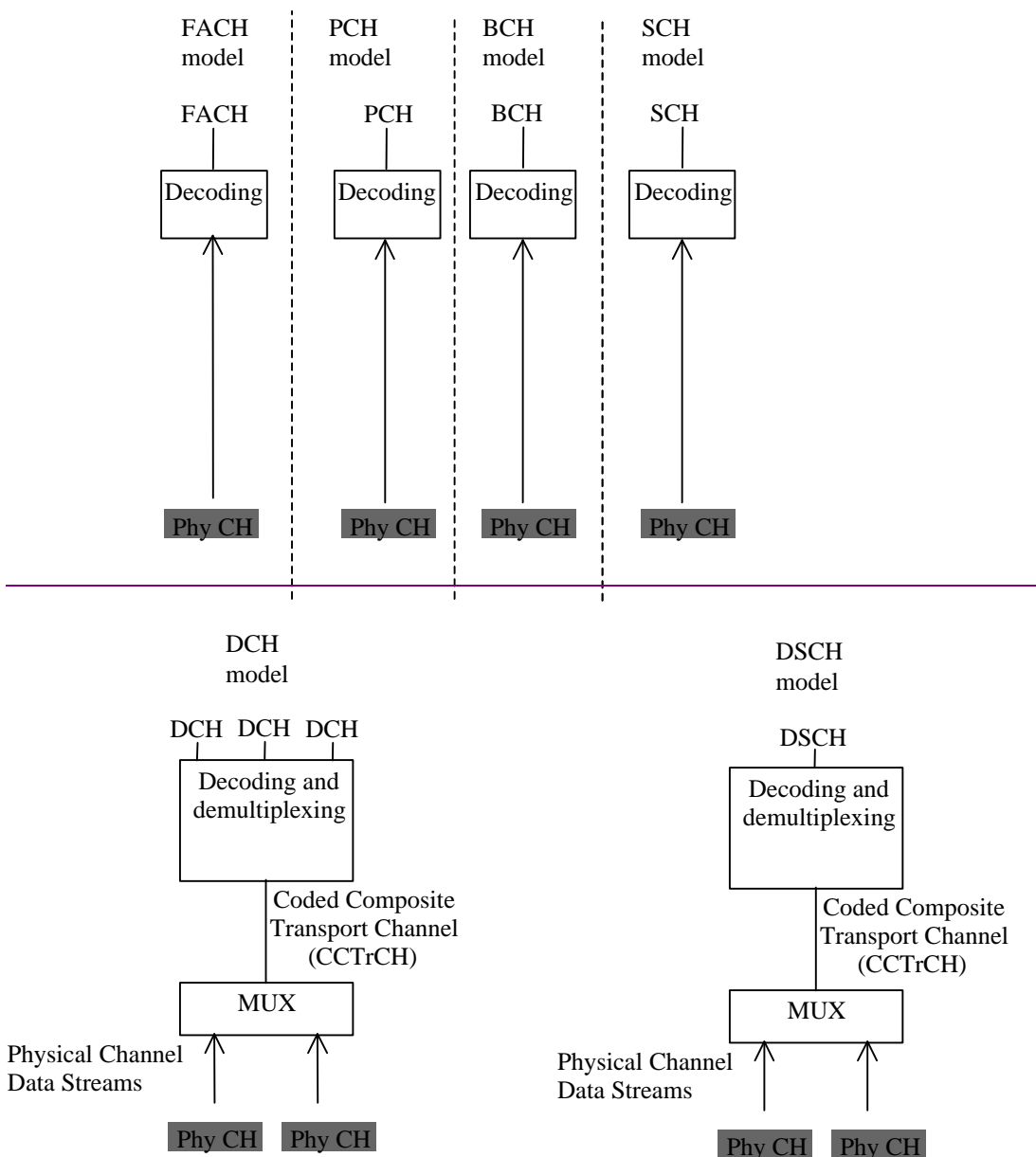


Figure 2: Model of the UE's physical layer – downlink TDD mode

For the DCH case, the mapping between DCHs and physical channel data streams works in the same way as for the uplink. Note however, that the number of DCHs, the coding and multiplexing etc. may be different in uplink and downlink.

In the FDD mode, the differences are mainly due to the soft and softer handover. Further, the pilot, TPC bits and TFCI are time multiplexed onto the same physical channel(s) as the DCHs. Further, the definition of physical channel data stream is somewhat different from the uplink.

Note that it is logically one and the same physical data stream in the active set of cells, even though physically there is one stream for each cell. The same processing and multiplexing is done in each cell. The only difference between the cells is the actual codes, and these codes correspond to the same spreading factor.

The physical channels carrying the same physical channel data stream are combined in the UE receiver, excluding the pilot, and in some cases the TPC bits. TPC bits received on certain physical channels may be combined provided that UTRAN has informed the UE that the TPC information on these channels is identical.

In the TDD mode, the downlink models for the BCH, PCH and FACH show that BCH, PCH and FACH are always mapped one-to-one onto physical channels, i.e. there is no physical layer multiplexing of BCH, PCH and FACH. Service multiplexing is handled by the MAC layer.

In the TDD mode, a PCH and a FACH can be encoded and multiplexed together forming a CCTrCH. The PCH is associated with a separate physical channel carrying page indicators (PIs) which are used to trigger UE reception of the physical channel that carries PCH. A FACH or a PCH can also be individually mapped onto separate physical channels. The BCH is always mapped onto one

physical channel without any multiplexing with other transport channels.

Note, in the TDD mode there is the SCH in addition (not shown in Figure 2).

In the FDD mode, a PCH and one or several FACH can be encoded and multiplexed together forming a CCTrCH. Similarly as in the DCH model there is one TFCI for each CCTrCH for indication of the transport formats used on each PCH and FACH. The PCH is associated with a separate physical channel carrying page indicators (PIs) which are used to trigger UE reception of the physical channel that carries PCH. A FACH or a PCH can also be individually mapped onto a separate physical channel. The BCH is, as for TDD, always mapped onto one physical channel without any multiplexing with other transport channels.

4 References

- [1] 3GPP TSGR2#4(99)413, Discontinuous Reception in Idle and Connected mode, Source: Ericsson
- [2] 3GPP TSGR2#5(99)590, Description of DRX, Source: Ericsson
- [3] 3GPP TSGR2#5(99)564, Proposal for changes in 25.302 according to new PCH structure, Source: Ericsson
- [4] 3GPP TSGR2#5(99)590, Description of DRX for TDD, Source: SIEMENS AG