

**Agenda Item:**

**Source:**            **Nokia**

**Title:**             **The use of Multiple Radio Links (CCTrCHs)**

**Document for:**    **Decision**

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## **1. Introduction**

There has been discussion in e-mail reflector about the use of multiple Coded Composite Transport Channels (CCTrCHs). It has been stated that because WG2 supports the use of several CCTrCHs why WG1 is not supporting it. Currently the WG1 opinion is that the use of several CCTrCHs is not supported (only for DSCH associated with DCH).

However, there are chapters 4.2.11.1 and 4.2.11.2 in 25.212 [1] where it is stated that multiple radio links (= multiple CCTrCHs) can be used. This is a clear contradiction which should be corrected to follow agreed opinion of WG1.

In this contribution we propose that the use of several CCTrCHs is not supported as mandatory either in DL or UL in Release 99. The reason for that is added complexity (at least in UE) and expected delays in tight standardisation schedules.

## **2. Reason to use multiple CCTrCHs**

The reason to use several CCTrCHs might be achieving the different quality of service targets for different services in a common radio link but this is already achieved by using different rate matching ratios for them. So, there is no need for additional complexity.

The other reason is that the transmitter power control in UE is simplified significantly if only one CCTrCH is used. This includes the TX filter and DA-converter structures because more dynamics is needed in the digital part of the transmitter if multiple CCTrCHs are required.

## **3. Text proposal**

## 4.2.11 Multicode Transmission

### 4.2.11.1 Downlink

- When ~~1 Radio Link one CCTrCH~~ consists of multiple dedicated physical channels (spreading codes), transmission shall be performed as described below, and pilot aided coherent detection and transmitter power control, etc. shall be performed comprehensively for all the dedicated physical channels in ~~1 Radio Link one CCTrCH~~. ~~When multiple Radio Links were allocated for one MS, pilot aided coherent detection and transmitter power control shall be performed independently for each Radio Link.~~
- The frame timing and scrambling code phase shall be matched at all dedicated physical channels in one ~~Radio Link CCTrCH~~. Also, the symbol rate of the multiple physical channels designated within one ~~Radio Link CCTrCH~~ shall all be the same.
- In all of the dedicated physical channels within one ~~Radio Link CCTrCH~~, the spreading codes used at one particular dedicated physical channel shall be used only for the pilot symbol and the TPC symbol part. (See ~~Error! Reference source not found.~~~~Error! Reference source not found.~~ [Figure 4-11](#))
- Transmission power of pilot symbols and TPC symbols in ~~1 Radio Link one CCTrCH~~ might be transmitted at a different transmission power from that multiplied by the number of dedicated physical channels in ~~1 Radio Link one CCTrCH~~ for the transmission power by symbols other than the pilot symbols and TPC symbols. (See ~~Error! Reference source not found.~~~~Error! Reference source not found.~~ [Figure 4-12](#))
- Generally,  $\delta$  shall be settled around the value which sets the power of DPCCCH part to be one-N th of the DPDCH part, where N is the number of dedicated physical channels in a radio link. But basically, there is no regulation about the difference  $\delta$  of transmission power.
- Mobile Station should reflect the difference  $\delta$  in target received SIR for downlink closed-loop transmission power control.

(Figures 4-18 and 4-20 are not shown here.)

### 4.2.11.2 Uplink

For multi-code transmission in one uplink ~~radio link CCTrCH~~, each additional uplink DPDCH may be transmitted on either the I or the Q branch, sharing a single common DPCCCH. Each DPDCH branch shall use its own spreading code, multiple DPDCHs on different branches may share a common scrambling code. ~~When multiple radio links are allocated for one MS, pilot aided coherent detection and transmit power control shall be performed independently for each radio link.~~

## 4. References

- [1] 25.212 V1.0.0 "Multiplexing and channel coding (FDD)"