

NEW WI ON A SIMPLIFIED HS-SCCH FOR UMTS

RP-171213 - Motivation for New proposed WI

BACKGROUND

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- › The HS-SCCH is a downlink control channel used for scheduling HS-DSCH transmissions, as well as for instructing the UE to perform specific actions via HS-SCCH orders.
- › The HS-SCCH is monitored by the UE at all path-loss conditions within the cell, however according to current observations the HS-SCCH becomes costly in bad radio conditions, which puts a limitation on its usability.
- › Being more specific, in bad radio conditions the power invested in the control information bits carried on the HS-SCCH limits the available power for the HS-PDSCH.

BACKGROUND

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- › The decoding of the HS-SCCH is performed by testing against all the codewords that can be carried over the HS-SCCH since any of those codewords could have been transmitted in downlink. Nonetheless under bad radio conditions only small subset of those codewords can occur in practice.
- › This is something that can be considered to enhance and simplify the decoding of the HS-SCCH channel.
- › During the study item phase it was concluded that the simplification on the HS-SCCH type 1 should consist of making “known in advance” the bits corresponding to the “Modulation Scheme” and the “Number of codes” (code group indicator bits), while its triggering mechanism should be based on the legacy CQI reports.

PROPOSED RAN WORK ITEM



- › Introduce a simplified version of the HS-SCCH Type1 where the “Modulation Scheme” and the “Number of codes” (code group indicator bits) are made deterministic (i.e., QPSK and 1 code). The following aspects shall be taken into consideration:
 - The L1 processing chain as described in the current UMTS standard shall be reused and no changes are allowed (i.e., adding/removing blocks to the L1 processing chain is not allowed).
 - Keep backward compatibility (e.g., re-ordering bits within a slot, or from one to another slot is not allowed).
- › Introduce a triggering mechanism for the simplified version of the HS-SCCH Type 1, by making use of the legacy CQI reports and the timing related aspects discussed during study item phase.
 - In addition to the CQI based triggering mechanism, HS-SCCH orders might be considered to create an interval where the HS-SCCH is received carrying QPSK and one code aiming at extending the usage of the simplified version of the HS-SCCH Type1.

BENEFITS



- › The main advantages of using a simplified HS-SCCH are the following ones:
 - Better performance in poor radio conditions
 - › Improves BLER
 - › Improves Miss detection Performance
 - › Improves False detection Performance
 - Power savings in DL (can be translated to coverage improvements)
 - Backward compatibility: The gains will be seen for the Rel-15 UEs, while legacy UEs can decode the HS-SCCH as usual providing the legacy performance.
 - Minimum standard impact (the HS-SCCH "L1 processing chain" is not modified at all).



ERICSSON