Agenda Item: AH10

Source: AH10 Chairman

Title: Discussion items in AH10 meeting

Document for: Approval

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1   Remaining items to be discussed at WG1#7

Since WG1#5 in Cheju, AH10 related matters have been discussed on reflector actively and the following documents have been submitted to WG1#6 and WG1#7.

For WG1#6

R1-99806:Text proposal for the figure of a downlink scrambling code generator (Nokia)
R1-99807:Text proposal on long scrambling codes for 3.84Mcps (Nokia)
R1-99828:Channelization code allocation in uplink multi-code transmissions(ETRI)
R1-99845:Uplink channelization code allocation in UTRA/FDD (Ericsson)
R1-99915:Multiple-Scrambling Code (Samsung)

For WG1#7

R1-99b20:Uplink channelization code allocation in UTRA/FDD, revised(Ericsson,ETRI)
R1-99b53:Time Delay between Physical Channels of Different Scrambling Codes (LGIC)
R1-99b87: A modified generator for Multiple-Scrambling Codes (Siemens)
R1-99b91: A Modified Mapping Rule for Multiple-Scrambling Codes (LGIC)

 In addition to the input documents, the folliong three items related with AH10 have been pointed out by TSGR1#6(99)868 at WG1#6 to be settled as soon as possible.

(1) The maximal number of physical channels for multi-code transmission for one user related with SF on DL
(2) Whether SF is unique for all codes of one user's DPCH in DL multicode transmission or not
(3) Whether scrambling code is common to all codes in DL multicode transmission for one user or not

For theitem (2), the consensus has been reached at AH9 of WG1#6 and the conclusion that SF is the same for all codes of one user's DPCH in DL multicode transmission is stated in TSGR1#6(99)877. So TSGR1#7(99) c03 at WG1#7 which is the updated version of TSGR1#6(99)868 excludes the item (2) from the list.

Further in addition to items (1) and (3), the following items related with AH10 should be discussed in WG1#7.
(4) Whether assignment of channelization code for RACH and UL DPCCH and DPDCH is designated by signalling from higher layer or predetermined value of layer 1.

This item (4) is related to the commnets shown below for Section 10.3.3.6 stated in R1-99a62 titled Answer to Liaison statement on TS 25.302, 'Services provided by the Physical Layer'.
Section 10.3.3.6
In uplink, there is no "DPCH" physical channel defined, but "DPCCH" and "DPDCH" should be used instead. Moreover, the channelization codes to use on the DPCCH and DPDCH are not signalled from higher layer, but are determined within L1 only.

2   Items to be settled related AH10 according to TSGR1#7(99)c03 and chairman's proposal for discussion

2.1 The maximal number of physical channels for multi-code transmission for one user related with SF on DL

If multi-code transmission is avoided as much as the highest SF of 4 can handle the rate, re-arrangement of codes in OVSF tree is needed among all DL users while the least number of demodulators are required for MS.
If free combination of SF and the number of codes, re-arrangement of codes is not needed but the number of demodulators required by MS is unallowablly large.

So some restriction should be set for the combination of SF and the maximal number of physical channels for multi-code transmission for one user.
The ristriction rules are proposed as follows.
Rule 1: For required total symbol rate equal or less than 120ksps, single code transmission shall be kept.
Rule 2: For required total symbol rate equal or less than 480ksps, at most two codes transmission shall be kept.
Rule 3: For required total symbol rate beyond 480ksps, maximal SF shall be 16.
Rule 4: SF is the same same for all codes of one user's DPCH in DL multicode transmission.

According to these rules, the concrete design for the combination of SF and the multi-code number are shown in tbe next table.
Though the receiver specification of UEs depends on UE class which may be discussed in TSG-T, this type of restriction should be specified by WG1 in order to optimize the total system.

required total symbol rate	combination of SF and the multi-code number N (SF,N)
15ksps	(256,1)
30ksps	(128,1)
60ksps	(64,1)
120ksps	(32,1)
240ksps	(16,1) or (32,2)
480ksps	(8,1) or (16,2)
720ksps (384kbps user)	(4,1) or (8,2) or (16,3)
2880ksps (2Mbps user)	(4,3) or (8,6) or (16,12)

2.2 Whether SF is unique for all codes of one user's DPCH in DL multi-code transmission or not

the consensus has been reached at AH9 of WG1#6 and the conclusion that SF is the same for all codes of one user's DPCH in DL multicode transmission is stated in TSGR1#6(99)877.

2.3 Whether scrambling code is common to all codes in DL multicode transmission for one user or not

If scrambling code is common, scrambling code re-arrangement may be needed when additional link comes into the system while MS despreading hardware is simple.
If primary scrambling code and secondary scrambling code are allowed to be mixed for one user, scrambling code re-arrangement is not needed while MS despreading hardware becomes more complicated.
It is proposed that mixture of primary scrambling code and secondary scrambling code shall be allowable setting the priority on code re-arrangement issue.

2.4 Whether assignment of channelization code for RACH and UL DPCCH and DPDCH is designated by signalling from higher layer or predetermined value of layer 1

Discussion is needed.