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Re:	IEEE 802.16e D5 Draft
Abstract	To improve the open loop MIMO Precoding
Purpose	To incorporate the changes here proposed into the 802.16e D5 draft.
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Open-loop MIMO Precoding

1 Background

The specification of the indication of use of open loop MIMO precoding is moved from the CQICH Enhanced allocation IE to the STC_ZONE IE.

Specific text changes

---------Start text proposal-------

[Modify the following Table 298a in section 8.4.5.4.12.1]

Table 298a. CQICH Enhanced allocation IE format

Syntax	Size (bits)	Notes
CQICH_Enhanced_Alloc_IE() {		
Extended DIUC	4	0x09
Length	4	Length in bytes of following fields
CQICH_ID	variable	Index to uniquely identify the CQICH resource assigned to the MSS
Period (=p)	2	A CQI feedback is transmitted on the CQICH every 2^p frames
Frame offset	3	The MSS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the current frame is specified, the MSS should start reporting in 8 frames
Duration (=d)	3	A CQI feedback is transmitted on the CQI channels indexed by the CQICH_ID for 10 x 2^d frames. If d== 0, the CQICH is de-allocated. If d == 111, the MSS should report until the BS command for the MSS to stop.
N_T actual BS antennas	3	001 = Reserved 010 = 2 actual antennas 011 = 3 actual antennas 100 = 4 actual antennas 101 = 5 actual antennas 110 = 6 actual antennas 111 = 7 actual antennas 000 = 8 actual antennas
Feedback_type	4	0000 = ~~Open loop precoding. Pilots in burst to be precoded with *W*. SS to rely only on pilots in burst for channel estimation.~~ Reserved 0001 = Complex weight of specific element of *W*

		0010 = Fast DL measurement 0011 = Layer specific channel strengths 0100 = MIMO mode and permutation zone feedback 0101 = Feedback of subset of antennas to use. 0110 ~ 1111 reserved
CQICH_Num	4	Number of CQICHs assigned to this CQICH_ID is (CQICH_Num +1)
for (i=0;i<CQICH_Num;i++) {		
Allocation index	6	Index to the fast feedback channel region marked by UIUC=0
}		
if (Feedback_type != 0100) { MIMO_permutation_feedback cycle }	2	00 = No MIMO and permutation mode feedback 01 = the MIMO and permutation mode indication shall be transmitted on the CQICH indexed by the CQICH_ID every 4 frames. The first indication is sent on the 8th CQICH frame. 10 = the MIMO mode and permutation mode indication shall be transmitted on the CQICH indexed by the CQICH_ID every 8 frames. The first indication is sent on the 8th CQICH frame. 11 = the MIMO mode and permutation mode indication shall be transmitted on the CQICH indexed by the CQICH_ID every 16 frames. The first indication is sent on the 16th CQICH frame.
Padding	*variable*	The padding bits are used to ensure the IE size is integer number of bytes.

[Modify the Table 277a in Section 8.4.5.3.4]

Table 277a -OFDMA downlink STC_ZONE IE format

Syntax	Size (bits)	Notes
STC_ZONE_IE() {		
Extended DIUC	4	STC/ZONE=0x01
Length	4	Length = 0x02
Permutation	2	00 = PUSC permutation 01 = FUSC permutation 10 = Optional FUSC permutation 11=Optional adjacent subcarrier permutation
Use All SC indicator	1	0 = Do not use all subchannels 1 = Use all subchannels
STC	2	00 = 3 antennas 01 = STC using 2 antennas 10 = STC using 4 antennas 11 = FHDC using 2 antennas
Matrix indicator	2	Antenna STC/FHDC matrix (see 8.4.8) 00 = Matrix A 01 = Matrix B 10 = Matrix C 11 = Reserved

IDcell	6	
Open-loop MIMO precoding	1	0 = No open loop MIMO precoding 1 = Open loop MIMO precoding used. Pilots to be precoded with precoding matrix W. Subscriber stations may only use pilots specific to its burst for channel estimation.
Reserved	~~3~~2	Shall be set to zero
}		

---------End text proposal-------