

Proposed UL Control Structure for 802.16m system

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on topic of 'Uplink Control Structures'

Base Contribution:

None

Purpose:

To be discussed and adopted by TGM for the 802.16m SDD

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About this contribution

- Scope
 - Provide Categorization of UL control channels,
 - Propose UL resource structure for UL control channels

Categorization of UL Control Information

- ACKCH & CQICH
 - Are DL-related feedback for all MSs including cell edge users
 - Should be carried in robust transmission such as orthogonal modulation

- Enhanced CQICH
 - Support various DL transmission such as MIMO and band selection
 - For some MSs who are located at inner-cell
 - Carries CQI per MIMO layer, RI(rank information) and PMI(Precoding Matrix Indication) for CL-MIMO, CINR per AMC subband

- Ranging
 - Allow contention and timing offset

Resource Structure for ACKCH, CQICH, E-CQICH

- ACK/CQI/Enhanced-CQI
 - Carry small number of information bits
 - Support robust transmission techniques
 - For ACK and CQI, Orthogonal modulation is applicable to small resource blocks (smaller than coherent time and BW)
 - Need sufficient frequency diversity gain
 - For reliable transmission of UL feedback w/o HARQ support,
 - Each control information should be transmitted over at least 3 different resource units
 - **Require small-sized RUs for UL Control channels**

Resource Structure for Ranging Region

- UL Ranging region
 - Exists only in the 1st UL mini-frame
 - To reduce the effect of timing offset
 - Consists of multiple UL DRUs
 - For frequency diversity and detection performance
 - Remaining resource should be multiples of default resource unit
 - has reasonable overhead

Text Proposal for Chapter 11 – PHY Layer

Insert the following text into Physical Layer Clause (i.e. Chapter 11 in [3]):

----- Text Start -----

11. Physical Layer

11.x UL Control Channel

11.x.1 CQICH

11.x.2 ACKCH

11.x.3 Enhanced CQICH

11.x.4 Ranging Channel

11.x.5 Resource Mapping for UL control channel

----- Text End -----

References

- [1] IEEE C802.16m-08/062r1, “Proposed 802.16m Frame Structure”
- [2] IEEE 802.16m-07/002r4, “IEEE 802.16m System Requirements”
- [3] IEEE 802.16m-08/003, “Draft IEEE 802.16m System Description Document”
- [4] IEEE 802.16m-07/037r2, “(Draft) IEEE 802.16m Evaluation Methodology Document ”