Proposed UL Control Structure for 802.16m system

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IEEE 802.16m-08/016, “Call for Contributions on Project 802.16m System Description Document (SDD)”,
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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Categorization of UL Feedback 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
  - For some MSs who are located at inner-cell
  - Support various DL transmission such as MIMO and band selection
  - 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 UL Control Channels

- ACK/CQI/Enhanced-CQI
  - Carry small number of information bits
  - Support robust transmission techniques
    - Orthogonal modulation is applicable to small resource blocks (smaller than coherent time and frequency)
  - Need only diversity subchannelization
    - 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 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

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 ”