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Title	**Session 56 UL PHY Rapp Group Chairs Report**	
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Re:		
Abstract	Chairs report on the development of the UL PHY Rapp Group SDD contribution for Session 56	
Purpose	Define UL PHY Structure for the 802.16m SDD	
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Session 56 UL PHY Rapp Group Chairs Report

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Draft Preparation

Based on contributions submitted to Session #55, Draft 1 was released on May 27, 2008. This draft consisted of a Table of Contents. On June 9, contributions submitted for Session 55 were used to create baseline content for Draft 2. New contributions and submissions were also accepted at this time. Some content was merged to eliminate redundant text.

Several interim drafts were produced to reflect the submission of more contributions and feedback between draft releases.

Draft 3 was generated based on content received by June 30, 2008. A PDF version of this draft was released along with a call for comments on the draft, the comments to be resolved during Session 56.

Session 56 Activity

Meeting Minutes (June 16 session)

Call to order: 08:06 the meeting was called to order with Apostolos Papathanassiou and Ron Murias chairing. The Chairs detailed the agenda for the day and directed the participants to the download location of the files required for the meeting. The main points of discussion revolved around the issues of tile size, resource unit mapping, and multiplexing mode for PUSC legacy systems.

Comment discussion (highlights)

The database contained 31 comments. The comments were reviewed in order of page number referenced in the document.

During the discussion of comment #5, it became clear that there may be cases where the context of a resource unit may not be clear. The Chairs were asked to highlight the issue to the SDD Editor and recommend that, where the (uplink or downlink) context is not obvious, a prefix denoting the transmission direction (i.e. UL- or DL-) should be used.

The group had a lengthy discussion on tile structure. One major issue is that it is difficult to move forward with things like pilot comparisons when there is not tile structure defined. On the other hand, pilot schemes have an impact on how to design the tile structure. The group decided to start with a 6x N_{sym} tile (N_{sym} depending on the subframe type) and to leave other possible tile structures for further study.

Resource mapping reached an agreement by harmonization done during the meeting.

The PUSC legacy issue was not resolved. We feel it is best to leave a “TBD” in the contribution to allow members to bring proper contributions to the Task Group for a thorough discussion.

The Group recessed at 12:06 to reconvene in the joint UL PHY/Control session. During this session, the UL PHY group closed the remaining comments and discussed plans for the Chairs report and the TGm contribution.

A vote was taken to forward the contribution (as modified by the database). There were no objections to forwarding the updated contribution to TGm. Following this, the two Rapp groups worked together to define comparison criteria based UL Control contributions.

Remaining Issues

Legacy support with PUSC remains undecided between (essentially) TDM and FDM. We felt that further discussion in the main group is most appropriate. We expect that interested parties will bring detailed contributions that clearly show the issues and proposed solutions.

TGm Contributions

C802.16m-08/872r1: UL PHY Rapp Group Chairs Report (this document)

C802.16m-08/873r2: UL PHY Rapp Group Contribution

C802.16m-08/874: UL PHY Rapp Group Commentary Database

Motion

To adopt the text in C80216m-08_873r2 as part of the SDD.

Appendix A

This appendix provides the design and down-selection criteria as documented in C80216mUL_PHY-08_018.doc which can be used as an initial point for the discussions and consensus building in the UL PHY RG.

Since the symbol structure is a tool to support various PHY functionalities (such as various MIMO modes, interference mitigation, etc), the 802.16m symbol structure should

1. broadly support potential basic PHY features
2. satisfy the SRD explicit and derived requirements and trade-offs, and
3. provide flexibility to add future advanced features.

The general UL PHY structure criteria are:

- Support both localized and distributed allocations
- Support different MIMO modes, # of antennas, # of streams, and # of users
    i. Open-loop SISO and MIMO transmission with 2 and 4 UL data streams
    ii. UL precoding/beamforming for multi Tx antenna MSs
    iii. Collaborative spatial multiplexing, with 2,4 Rx antennas, and 1,2 Tx antennas per user [Support for up to four single-stream users in collaborative spatial multiplexing (CSM) mode]
- Criteria for tile size and pilot pattern selection
    i. Optimize the tradeoff between diversity and pilot efficiency for distributed resources
    ii. Optimized for collaborative MIMO as main mode (rather than SISO) with acceptable performance for SIMO
    iii. Minimize power fluctuation across OFDMA symbols after pilot power boosting is applied (if applicable)

iv. Mobility support according to the SRD: Optimized for Pedestrian 0 - 10 km/h; graceful degradation for Vehicular 10 - 120 km/h; maintain connection for mobile speeds up to 350 km/hr

- Support various UL Control Channels (Ranging, ACK/NACK, CQICH)
- Optimize for the overall UL system throughput, but also consider and include the cell-edge and high-mobility user performance enhancement for link budget and Tx power

- UL performance shall be evaluated using actual channel and weight estimation algorithms taking into account:
  - Proposed pilot locations and pilot sequences that enable an efficient frequency offset, time offset and noise estimation
  - The effects of realistic time and frequency offsets
  - Consideration of both noise limited and interference limited scenarios.