

16m Downlink Assignment Channel Design

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Target topic: “11.7 DL PHY control structure, especially mapping”.

Base Contribution:

C80216m-09/0208

Purpose:

To be discussed and adopted by TGM for use in stage 3 document development

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Outline

- Objectives
- System Level Performance Evaluation
- Conclusions and Proposed Text
- Appendix

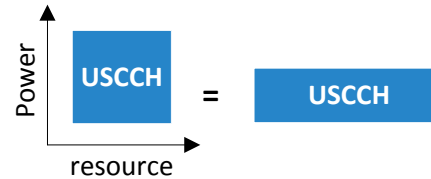
Objectives

- Fixed MCS vs. Variable MCS
 - IE bit size: 48 bits
 - Fixed MCS
 - QPSK 1/2 or QPSK 1/2 with x2
 - Variable MCS
 - QPSK 1/2 with x1, x2, x4, x6
- *Which One is better for USCCH?*
- Performance Metrics for SLS Verification
 - **Sector Throughput** with satisfying outage requirement
 - **Outage** requirement: Distribution of user whose BLER is larger than 1% < 3% of total users

System Level Performance Evaluation (1/3)

- Fixed vs. Variable

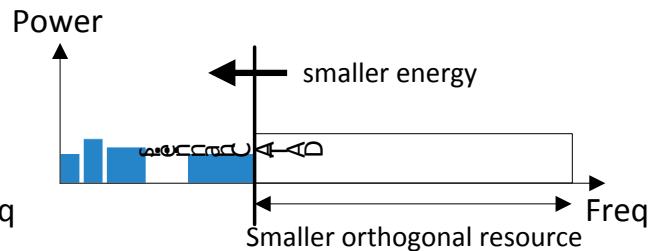
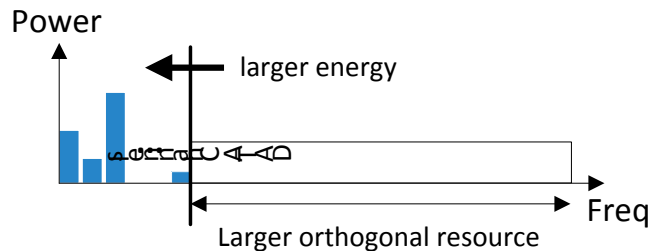
If required energy for USCCH is identical for both boosting and repetition,



Fixed MCS (QPSK, 1/2)

vs.

Variable MCS



For Data Region,

- Larger orthogonal resource
- lower power level

vs.

- Smaller orthogonal resource
- Higher power level

– Orthogonal resource is more efficient to increase Data rate

- y dB power gain \neq y dB capacity (data rate) gain

System Level Performance Evaluation (2/3)

- Fixed vs. Variable
 - Variable obtains Diversity gain from symbol combining
 - Can reduce required power for USCCH

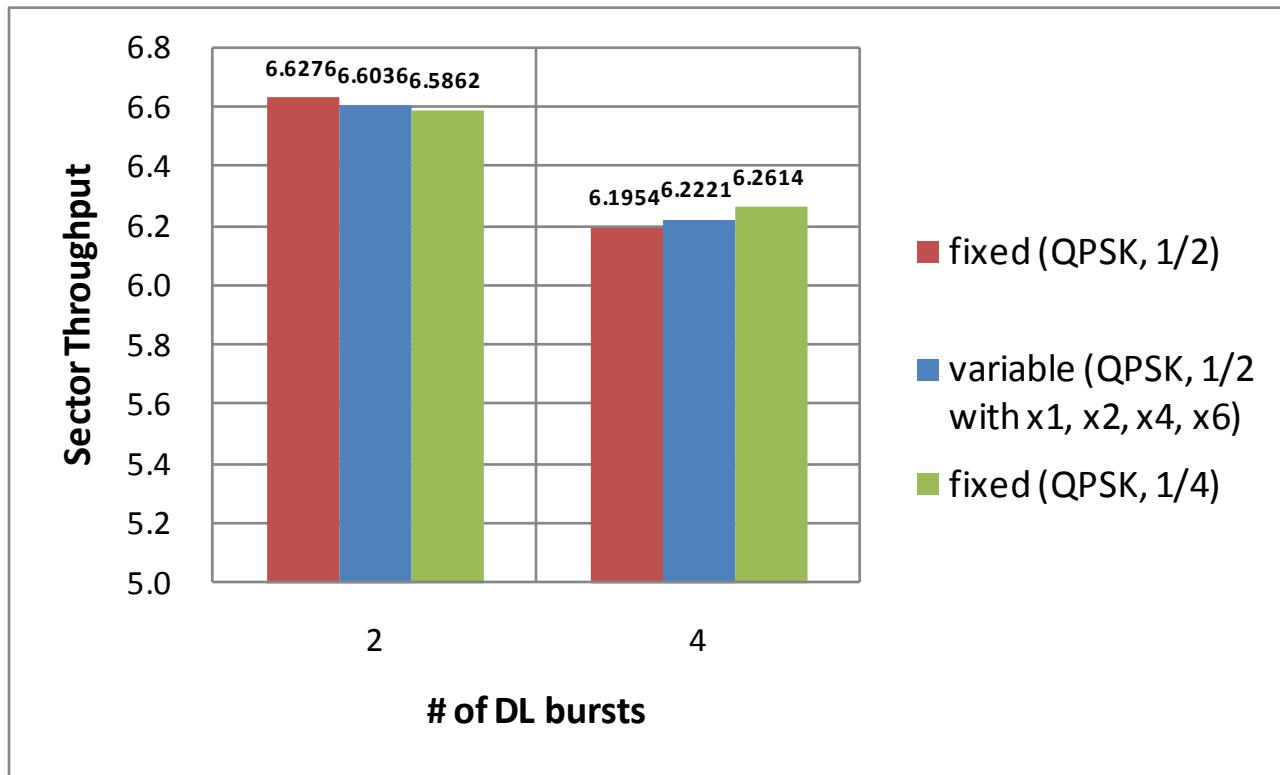


SLS Evaluation includes

- Orthogonal resource vs. power
- Diversity gain
- And other minor effects

System Level Performance Evaluation (3/3)

- Metric: Data Throughput
 - Outage < 3%



Conclusions and Proposed Text

- Conclusion
 - Fixed MCS is preferred
 - MCS level: QPSK 1/2 or QPSK 1/4
 - MCS level can be indicated by BCH
- Proposed
 - See C80216m-09/0208

Appendix-A

- Simulation Condition for SLS

SLS Conditions (1/2)

- Environments/Assumptions

Index	Value
Deployment Scenario	EMD baseline [IEEE 802.16m-07/037r2]
MCS for USCCH (Assignment)	Fixed: QPSK 1/2, QPSK 1/4 Variable: QPSK 1/2 with x1, x2 (x4, x6)
HARQ	Asynchronous (DL)
Scheduler	Proportional fairness
# of Users per Sector	20
# of Scheduled Users	2, 4 per subframe (4, 8 for both DL and UL)
Antenna Configuration	SIMO 1x2
Channel Model	Mixed (Ped B-3kmph-60%, Veh A-30kmph-30%, Veh A-120kmph-10%)
Channel Estimation	Real channel estimation (Channel estimation impairment)
Other Simulation Assumptions	EMD baseline

SLS Conditions (2/2)

- Per User Power Control for Assignment Block
 - $P_{\text{MAPIE}}[i] = \text{SINR}_{\text{REQ}} - \text{SINR}(\text{CQI})[i] + \Delta_{\text{MARGIN}}[i]$
 - SINR_{REQ} : SINR value required to satisfy 1% BLER
 - $\text{SINR}(\text{CQI})[i]$: i-th user SINR set by CQI feedback value
 - $\Delta_{\text{MARGIN}}[i]$: Margin value to accomplish required outage