

# Physical Structure for BW-REQ Channel

IEEE 802.16 Presentation Submission Template (Rev. 9)

Document Number:

IEEE C80216m-09/0191

Date Submitted:

2009-01-07

Source:

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Venue:

Session #59, San Diego, USA

Re:

802.16m SDD

Base Contribution:

None

Purpose:

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

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# Physical Structure for BW-REQ Channel

*Jan, 2009*

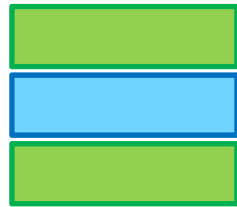
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# PHY Structure for BW-REQ

16m Green field



16m PUSC



## ▪ Tile structure

- Three (6X6) tiles for Green field mode,
- Three (4X6) tiles for 16m PUSC mode,

## ▪ Ratio of indicator/message

- Resource Ratio = 2:1 for Green field
- BW indicator only for 16m PUSC mode,

## ▪ BW-REQ indicator (BR code)

- (4X6)X3 tones,
- (Semi/Quasi) orthogonal sequence,

## ▪ BW-REQ message

- ~12 info bits through (2X6)X3 tones,
- QPSK modulated block code (rate : 1/6)

# Design Criteria for BW-REQ Indicator

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- **Sequence Candidates for BR indicator**
  - Orthogonal sequence
    - **24 length Hadamard sequence**
  - Quasi/semi-orthogonal sequence
    - Truncated Zadoff-Chu sequence
  - ~~Pseudo-random sequence (m-sequence)~~
- **Evaluation Criteria for BR indicator sequence**
  - Detection performance (Missing/FA Probability)
  - Number of BR opportunities
  - Channel estimation for detecting the BR message

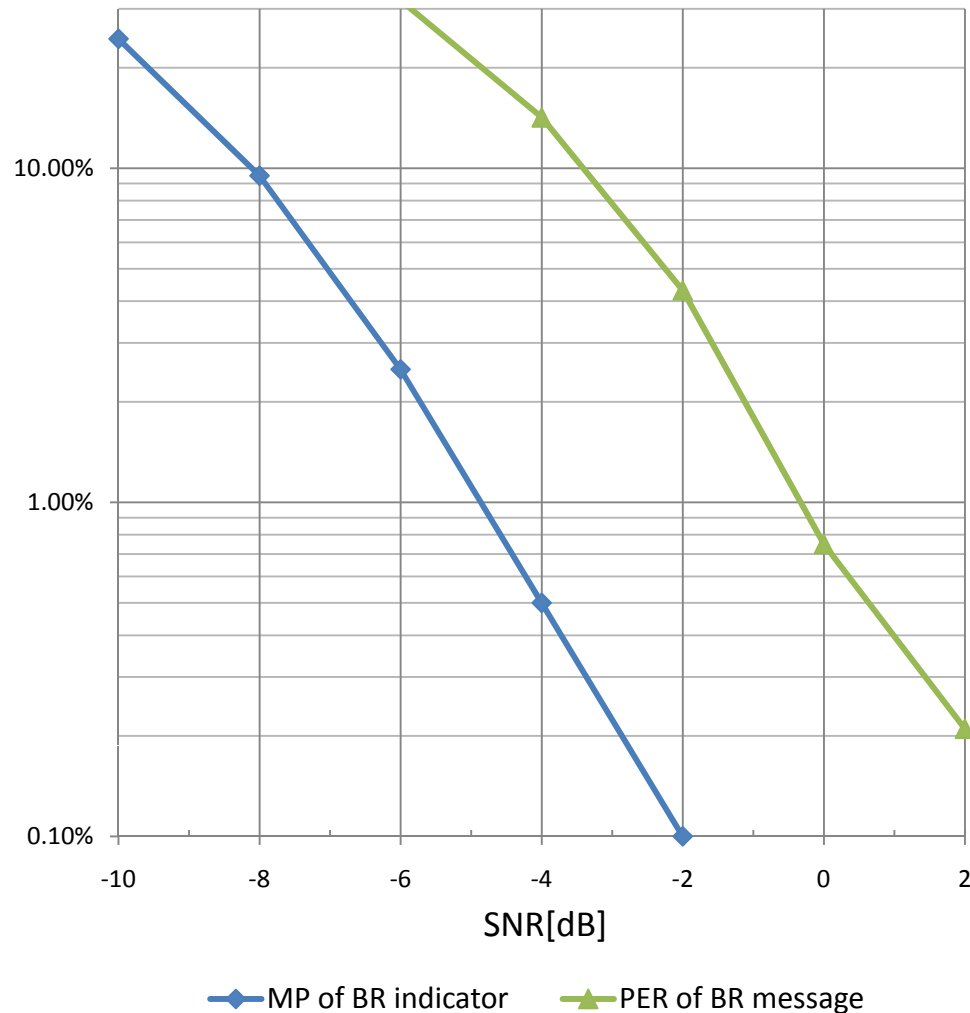
# Usage Example for BR Indicator

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- **How to use 24 orthogonal sequences**
  - Efficient support both 3 step & 5 step procedures,
- **We can divide 24 sequences into 2 subgroups,**
  - Subgroup1 can carry 4 bits additional information for 3 step BW-REQ procedures (Sequences #1~16)
  - Subgroup2 can be used for 5 step BW-REQ procedure (Sequences #17~24)
- **Benefits of Subgroups**
  - No false alarm detection for BW-REQ message is required

# Detection Performance

BW-REQCH (Ped B 3km)



## ■ BR indicator

- False alarm rate < 0.1%,
- 1% Missing Probability @ -5.0dB

## ■ BR message

- One BR message only,
- Channel coding is not optimized yet,
- No false alarm rate
- 1% PER @ -0.6dB

# Concluding Remarks

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- **PHY structure for BW-REQ consists of**
  - Three (6X6) tiles,
  - (4X6) sub-tiles are used for BW-REQ indicator
  - (2X6) sub-tiles are used for BW-REQ message
- **In a legacy support mode (16m PUSC),**
  - Only BW-REQ indicators are transmitted,
  - Only 5 step BR procedures are supported,
- **Different BW-REQ indicators for different BR procedures**
- **To meet their different required SNR,**
  - BW-REQ message can be boosted over BW-REQ indicator