Physical Structure for BW-REQ Channel

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        None

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

Physical Structure for BW-REQ Channel

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PHY Structure for BW-REQ

16m Green field

16m PUSC

BW-REQ indicator
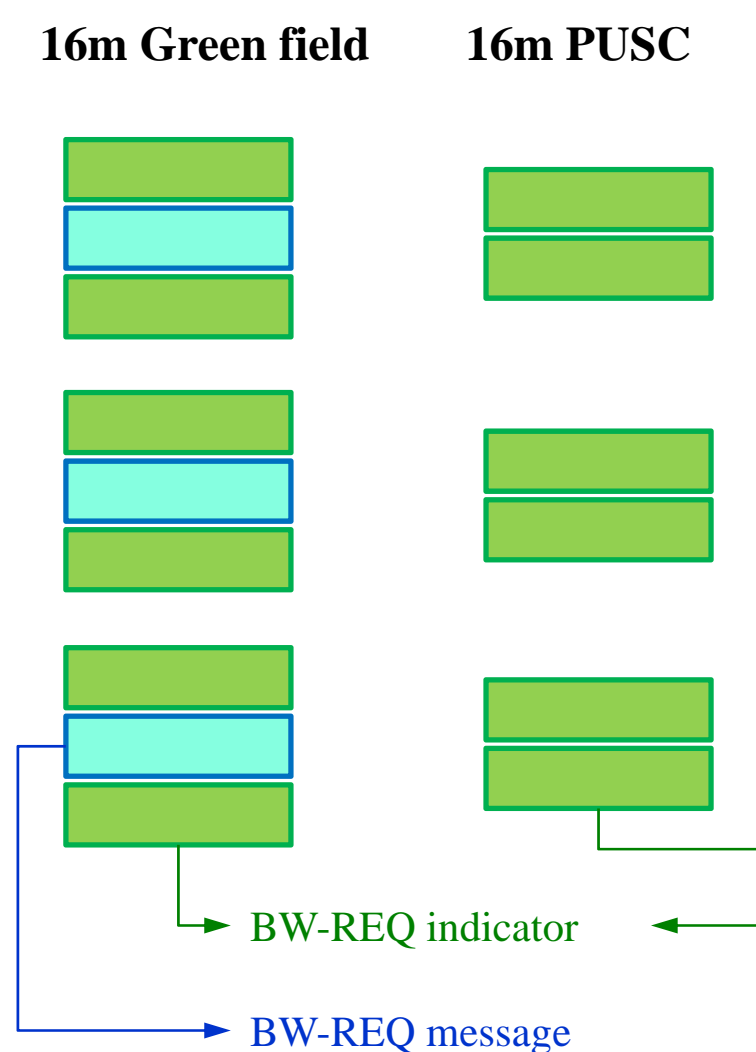
BW-REQ message

- **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,
  - Binary orthogonal sequence, (Hadamard)
- **BW-REQ message**
  - ~12 info bits through (2X6)X3 tones,
  - QPSK modulated block code (rate : 1/6)

Usage Example for BR Indicator

- **How to use 24 orthogonal sequences**
  - 24 binary orthogonal sequences can be generated with 24 tones
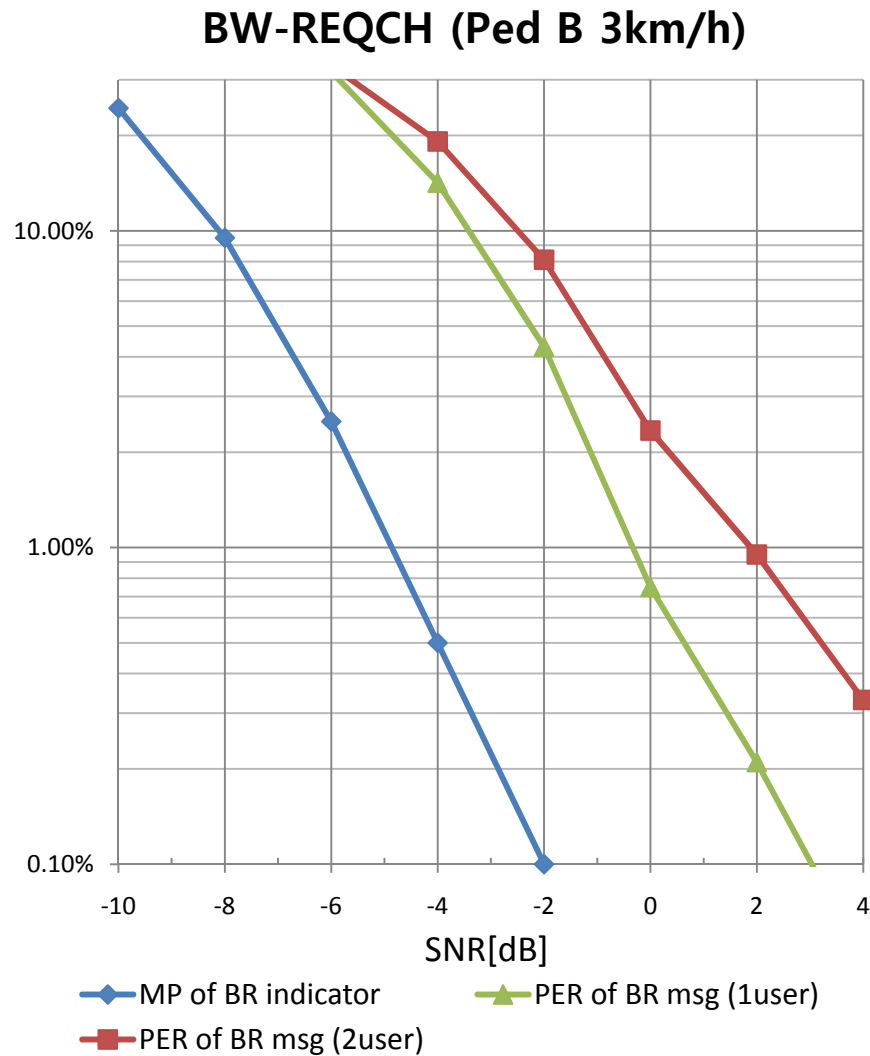 - Efficient support both 3 step & 5 step procedures

- **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 (i)

BW-REQCH (Ped B 3km/h)

- **BR indicator**
  - False alarm rate < 0.1%,
  - 1% Missing Probability @ -5.0dB SNR

- **BR message**
  - 3 times repeated (24, 12) Block code
  - QPSK modulation
  - No false alarm rate

  - For 1 user detection, 1% PER @ -0.6dB
  - For 2 user detection,
  - 1% PER @ 2dB

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Detection Performance (ii)
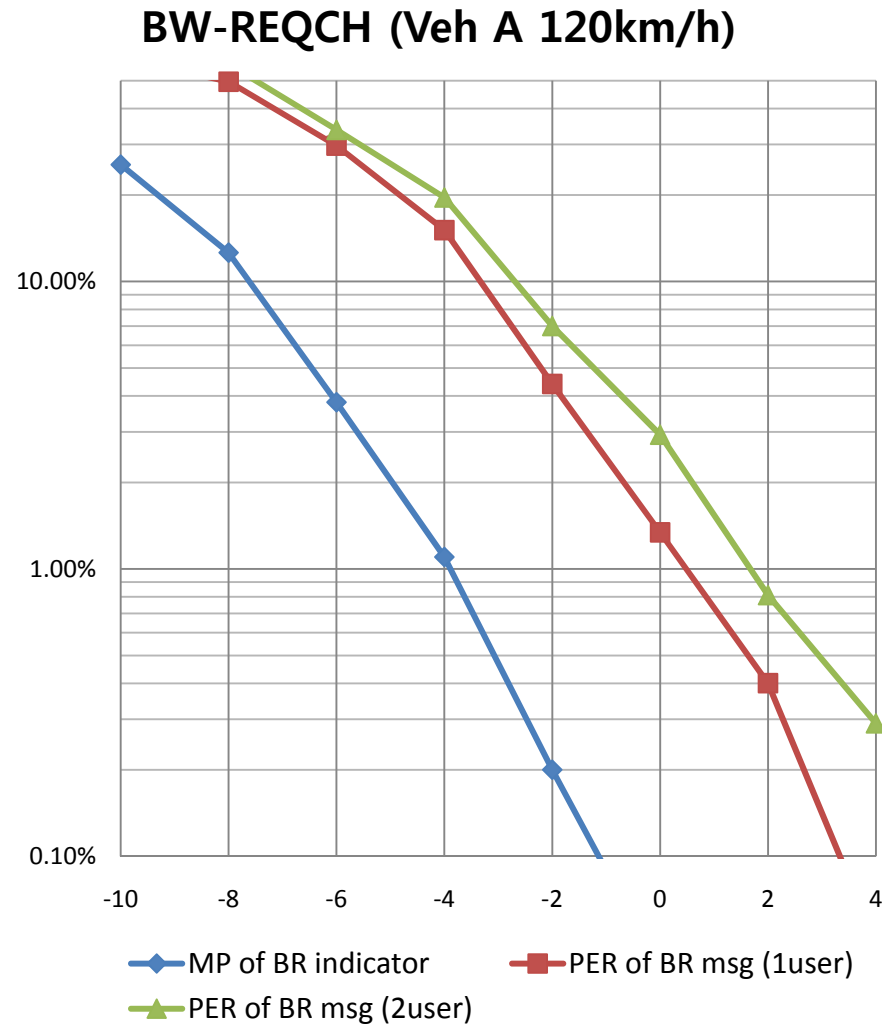
BW-REQCH (Veh A 120km/h)

- **BR indicator**
  - False alarm rate < 0.1%,
  - 1% Missing Probability @ -4.0dB SNR

- **BR message**
  - 3 times repeated (24, 12) Block code
  - QPSK modulation
  - No false alarm rate

  - For 1 user detection, 1% PER @ 0.4dB
  - For 2 user detection,
  - 1% PER @ 1.8dB

Concluding Remarks

- **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

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Text Proposal for BW-REQCH

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

11.9.2.5 Bandwidth Request Channel

11.9.2.5.2 PHY structure

[Insert the followings in line 7, page 111]

A BW REQ tile is defined as 6 contiguous subcarriers by 6 OFDM symbols. Each BW REQ channel consists of 3 distributed BW-REQ tiles. For legacy support mode, a BW REQ tile is defined as 4 contiguous subcarriers by 6 OFDM symbols.

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