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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | **Clarification on talk-around direct communication**  |
| Date Submitted | **2012-9-13** |
| Source(s) | Seokki Kim, Sungcheol Channg, Miyoung Yun, Won-Ik Kim, Hyun Lee, Sungkyung Kim, Chulsik YoonETRI | Voice: +82-42-860-0626E-mail: kimsk0729@etri.re.kr |
| Re: | Sponsor Ballot on IEEE P802.16.1a/D5 |
| Abstract | This contribution is for clarification on talk-around direct communication |
| Purpose | For discussion in GRIDMAN TG and adoption into 16.1a draft |
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**Clarification on talk-around direct communication**

Seokki Kim, Sungcheol Chang, Miyoung Yun, Won-Ik Kim, Hyun Lee, Sungkyung Kim, Chulsik Yoon

ETRI

# Introduction

This contribution provides clarification on the transmission scheme and power level for talk-around direct communication.

# References

[1] IEEE P802.16.1a/D5, WirelessMAN-Advanced Air Interface for Broadband Access Systems – Draft Amendment: Higher Reliability Networks, Aug. 2012.

# Proposed Text

Note:

The text in **BLACK** color: the existing text in the 16.1a draft

The text in **~~RED~~** color: the removal of existing 16.1a draft

The text in **BLUE** color: the new text added to the 16.1a draft

[-------------------------------------------------Start of Text Proposal---------------------------------------------------]

# *[Remedy1: Modify the following text in each sections in the IEEE P802.16.1a/D5]*

**6.12.2.3.2.2 Synchronization channel**

…

In addition to the frequency synchronization, the synchronization channel is used for acquiring time synchronization. Synchronization channel shall be used to estimate the transmission timing of the direct communication channels to prevent timing offset between the desired signals and interference signals at the receiver.

The transmit power per subcarrier and per stream for synchronization channel is defined as follows.

$$P=\frac{P\_{tx,sync}}{N\_{subcarrier}}×\frac{1}{TNS}$$

where $P\_{tx,sync}$ is the transmit power of synchronization channel. $TNS$ is total number of streams and $N\_{subcarrier}$ is the number of subcarriers allocated in each subframes. For Sync-CH transmission, $TNS$ is 2 and $N\_{subcarrier}$ is 72.

**6.12.2.3.2.2.2 Preamble sequence for synchronization channel**

…

Where $S\_{k}^{j}$ is the *k*-th bit of the *j*-th preamble sequence. The sending HR-MS selects one of the preamble sequences to generate the SYNC-CH preamble, while the receiving HR-MS shall be able to detect all the preamble sequences with considering the preamble patterns.

The SFBC is not supported for Sync-CH preamble transmission.

**6.12.2.3.2.3 Dedicated channel (Ded-CH) structure**

As described in 6.12.2.3.2.1, resources for Ded-CH is divided into Nded-subchannel dedicated subchannels for each TDC frame according to the number of subframes assigned for the logical frame. By using the dedicated subchannel, two types of signals can be transmitted: one is Ded-CH packet and the other is Ded-CH preamble. For each dedicated subchannel, four LRUs are assigned.

The transmit power per subcarrier and per stream for dedicated channel is defined as follows.

$$P=\frac{P\_{tx,ded}}{N\_{subcarrier}}×\frac{1}{TNS}$$

where $P\_{tx,ded}$ is transmit power of dedicated channel. $TNS$ is total number of stream and $N\_{subcarrier}$ is the number of subcarriers allocated in each subframes. For Ded-CH transmission, $TNS$ is 2 and $N\_{subcarrier}$ is 6,12,18,24 or 36.

**6.12.2.3.2.3.2 Ded-CH preamble transmission**

…

Using the Ded-CH preamble, the receiver can estimate time offset, frequency offset, link SINR (signal to interference plus noise ratio), radio channel, etc.

The SFBC is not supported for Ded-CH preamble transmission.

**6.12.2.3.2.4 Supplementary channel**

…

Figure 256 describes the Sup-CH structure for TDC. Details of the Sup-CH structure are defined in 6.12.2.3.2.1. One Sup-CH is composed of four distributed mini-tiles, where a mini-tile has (2 subcarriers) x (5 symbols) rectangular-shaped resource elements. A Sup-CH includes ranging channel, CQI channel, and feedback channel, which are transmitted in TDM (time division multiplexing) manner.

The transmit power per subcarrier and per stream for supplementary channel is defined as follows.

$$P=\frac{P\_{tx,sup}}{N\_{subcarrier}}×\frac{1}{TNS}$$

where $P\_{tx,sup}$ is transmit power of supplementary channel. $TNS$ is total number of stream and $N\_{subcarrier}$ is the number of subcarriers allocated in each subframes. For Sup-CH transmission, $TNS$ is 2 and $N\_{subcarrier}$ is 8.

The SFBC is not supported for Sup-CH transmission.

**6.12.2.3.2.9 Power control**

The HR-MS shall be able to control the transmit power per subframe and determine the transmit power, $P\_{tx,sync}, P\_{tx,ded}, P\_{tx,sup}$, within the maximum power level for Sync-CH, Ded-CH and Sup-CH, respectively.

For dedicated channel transmission, sending HR-MS inform receiving HR-MS of its ~~Tx~~transmit power,$ P\_{tx,ded}$, by AAI-DC-RTS message. For supplementary channel transmission, receiving HR-MS may reduce its ~~Tx~~transmit power,$ P\_{tx,sup}$, compared to $P\_{tx,ded}$~~Tx power of sending HR-MS~~ if it determines that it is in close proximity to the sending HR-MS.

[-------------------------------------------------End of Text Proposal---------------------------------------------------]