IEEE P802.11
Wireless LANs

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| LB189 D2.2 11af Comment Resolutions on PHY |
| Date: 2013-01-14 |
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* *Abstract: Resolutions of D2.2 comments on PHY CIDs 1002, 1003, 1004, 1005, and 1033*

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| 1002 | Hongyuan Zhang | 23.3.4.6 | 228.44 | The TVHT-STF construction for multi-segment transmission was not covered in 22.3.4.6. Need to specify how to contruct TVHT-STF in the case of multisegment. Ditto in 23.3.4.7 for TVHT\_LTF. | Add sub-bullets for multi-segment duplication of TVHT-STF/LTF, before the phase rotation sub-bullet. | **Revised** |
| 1003 | Hongyuan Zhang | 23.3.4.8 | 229.01 | The TVHT-SIG-B construction for multi-segment transmission was not covered in 22.3.4.8. Note that now TVHT-SIG-B in more than one BCU is constellation repeated instead of information bit repeated as in clause 22, refer to 23.3.8.2.6. | Add sub-bullet for multi-segment duplication of TVHT-SIGB, before the phase rotation sub-bullet. | **Revised**  |
| 1005 | Hongyuan Zhang | 23.3.8.2.6 | 238.54 | Time domain waveform equation for TVHT-SIGB is missing | Add a new paragraph at the end "The time domain waveform of the TVHT-SIG-B field in each BCU is specified in equation (22-43) where......" | **Revised** |

**Discussions***:* Agree with the commenter that the SIGB transmission in multi-segment cases need to be stressed that it is different from 11ac. Same things apply to TVHT-STF and TVHT-LTF.

**Proposal: Revised for CIDs 1002, 1003, 1005. The proposed editorial instructions are included in this document as shown below.**

*TGaf Editor: Pls make the following change in clause 23.3.4.6 and 23.3.4.7 and 23.3.4.8:*

**23.3.4.6 Construction of TVHT-STF**

Construct the TVHT-STF field for each BCU as defined in 23.3.8.2.4 (TVHT-STF definition) following the procedure in 22.3.4.6 (Construction of VHT-STF) with channel bandwidth being 40MHz, reading Clause 23 for references to Clause 22 except:

 b) Phase rotation: Apply appropriate phase rotation as defined in 23.3.7 (Mathematical description of signals).

 f) Insert GI and apply windowing: prepend a GI (LONG\_GI) and apply windowing as defined in 23.3.7 (Mathematical description of signals).

In mutiple BCU transmissions TVHT\_MODE\_2C, TVHT\_MODE\_2N, TVHT\_MODE\_4C, and TVHT\_MODE\_4N, the TVHT-STF subcarriers of one BCU are repeated in each BCU with an approriate phase rotation factor being applied as described in 23.3.8.2.4 (TVHT-STF definition).

**23.3.4.7 Construction of TVHT-LTF**

Construct the TVHT-LTF field for each BCU as defined in 23.3.8.2.5 (TVHT-LTF definition) following the procedure in 22.3.4.7 (Construction of VHT-LTF) with channel bandwidth being 40MHz, reading Clause 23 for references to Clause 22 except:

b) Phase rotation: Apply appropriate phase rotation as defined in 23.3.7 (Mathematical description of signals).

 c) Pilot insertion: Insert pilots following the steps defined in 23.3.10.10 (Pilot subcarriers).

h) Insert GI and apply windowing: prepend a GI (LONG\_GI) and apply windowing as defined in 23.3.7 (Mathematical description of signals).

In mutiple BCU transmissions TVHT\_MODE\_2C, TVHT\_MODE\_2N, TVHT\_MODE\_4C, and TVHT\_MODE\_4N, the TVHT-LTF subcarriers of one BCU are repeated in each BCU with an approriate phase rotation factor being applied as described in 23.3.8.2.5 (TVHT-LTF definition).

**23.3.4.8 Construction of TVHT-SIG-B**

The TVHT-SIG-B field is constructed per-user for each BCU as defined in 22.3.4.8 (Construction of VHT-SIG-B) with channel bandwidth being 40MHz, reading Clause 23 for references to Clause 22 except:

 k) Phase rotation: Apply the appropriate phase rotations as defined in 23.3.7 (Mathematical description of signals).

 m) Insert GI and apply windowing: prepend a GI (LONG\_GI) and apply windowing as defined in 23.3.7 (Mathematical description of signals).

In mutiple BCU transmissions TVHT\_MODE\_2C, TVHT\_MODE\_2N, TVHT\_MODE\_4C, and TVHT\_MODE\_4N, the TVHT-SIG-B subcarriers of one BCU are repeated in each BCU with an approriate phase rotation factor being applied as described in 23.3.8.2.6 (TVHT-SIG-B definition).

*TGaf Editor: Pls make the following change in clause 23.3.8.2.6 in page 238:*

**23.3.8.2.6 TVHT-SIG-B definition**

The TVHT-SIG-B field for each BCU in any transmission mode is as defined in 22.3.8.2.6 (VHT-SIG-B def­inition) for 40 MHz bandwidth.

The 27 TVHT-SIG-B bits are first repeated twice, and then BCC encoded, interleaved and made into con­stellations as described by Figure 22-20 and the corresponding text in 22.3.8.2.6 (VHT-SIG-B definition). If the channel bandwidth of the current PPDU is TVHT\_W, then the IDFT is conducted as defined in 22.3.8.2.6 (VHT-SIG-B definition).

The time domain waveform for the TVHT-SIG-B field in each BCU in a TVHT PPDU is the same as Equation (22-47) with channel bandwidth being 40MHz. If the channel bandwidth of the current PPDU is larger than TVHT\_W, then the TVHT-SIG-B subcarriers as described above are repeated in each BCU, with appropriate phase rotation factors  being applied as shown in Table 23-12 (Transmission mode and Gamma subk,m), before conducting IDFT.

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| 1004 | Hongyuan Zhang | 23.3.4.9 | 229.12 | The data encoding and modulation flow for multi-segment transmissions using BCC and LDPC was not covered in 22.3.4.9, and the segment parser and deparser in 22.3.4.9 was also removed in clause 23, where we are now using a joint interleaver.or joint LDPC tone mapper. | Add text to differentiate the construction of the data field when in multi-segment modes, from 22.3.4.9. | **Revised** |
| 1033 | Xun Yang | 23.3.3 | 226.04 | There is no definition/description for the module "Subcarrier Allocation". | Add the definition /description of "Subcarrier Allocation". | **Revised** |

**Discussions***:* Agree with the commenter that the multi-segment data field cases are different from what mentioned in the counterpart clauses in 11ac. Need to add the corresponding text.

Also we need to add clear text descriptions on the “subcarrier allocation” block.

**Proposal: Revised for CIDs 1004 and 1033. The proposed editorial instructions are included in this document as shown below.**

*TGaf Editor: Pls make the following change in clause* 23.3.3 *in the last paragraph at page 225 lines 58~60 :*

**23.3.3 Transmitter block diagram**

**…..**

Figure 23-2 (Transmitter block diagram for the Data field of a TVHT\_MODE\_2N or TVHT\_MODE\_4N SU PPDU with BCC encoding) and Figure 23-3 (Transmitter block diagram for the Data field of a TVHT\_MODE\_2N or TVHT\_MODE\_4N SU PPDU with LDPC encoding) show the transmit process for generating the Data field of a TVHT\_MODE\_2N or TVHT\_MODE\_4N SU PPDU with BCC and LDPC encoding~~,~~ respectively, where the subcarrier allocation block allocates the subcarriers for the two IDFTs in each transmit path by the subcarrier mapper as described in 23.3.10.11.1 (Transmission in VHT format).

*TGaf Editor: Pls make the following change in clause 23.3.4.9 in page 229:*

**23.3.4.9.1 Using BCC**

The construction of the Data field in a TVHT SU PPDU with BCC encoding proceeds as defined in 22.3.4.9.1 (Using BCC) reading Clause 23 for references to Clause 22 except:

 f) Segment parser is omitted.

~~o~~m) Phase rotation: Apply the appropriate phase rotations as defined in 23.3.7 (Mathematical description of signals). When in TVHT\_MODE\_2N or VHT\_MODE\_4N, allocate the subcarriers for the two IDFTs in each transmit path as described in 23.3.10.11.1 (Transmission in VHT format).

~~q~~o) Insert GI and apply windowing: prepend a GI (SHORT\_GI or LONG\_GI) and apply windowing as defined in 23.3.7 (Mathematical description of signals).

**23.3.4.9.2 Using LDPC**

The construction of the Data field in a TVHT SU PPDU with LDPC encoding proceeds as defined in 22.3.4.9.2 (Using LDPC) reading Clause 23 for references to Clause 22 except:

 f) Segment parser is omitted.

~~n~~m) Phase rotation: Apply the appropriate phase rotations as defined in 23.3.7 (Mathematical description of signals). When in TVHT\_MODE\_2N or VHT\_MODE\_4N, allocate the subcarriers for the two IDFTs in each transmit path as described in 23.3.10.11.1 (Transmission in VHT format).

~~p~~o) Insert GI and apply windowing: prepend a GI (SHORT\_GI or LONG\_GI) and apply windowing as defined in 23.3.7 (Mathematical description of signals).

*TGaf Editor: Pls make the following change in clause 23.3.10.11.1* *in page 241 lines 58~60 :*

**23.3.10.11.1 Transmission in VHT format**

**…..**

For multi-segment transmissions TVHT\_MODE\_2N and TVHT\_MODE\_4N, each frequency segment shall follow the waveform as described in Equation (22-91), and the data and pilot subcarriers are allocated by the subcarrier allocation block, as shown in Figure 23-2, to the two IDFT blocks according to the subcarrier mapping…