IEEE P802.11
Wireless LANs

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| TGah D0.1 PHY Comment Resolutions on Clause 24.2.2, 24.2.3 |
| Date: 2013-09-09 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Minho Cheong | ETRI | Gajeong-dong, Yuseong-gu, Daejeon, Korea | +82-42-860-5635 | minho@etri.re.kr |
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This document provides PHY resolutions for CIDs on Clause 24.2.2, 24.2.3.

| **CID** | **Commenter** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed change** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 196 | Hongyuan Zhang | 24.2.2 | 184 | 45 | MU is only for >=2MHz long preambles | Add condition "Format is SIG and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE..."in first row of MU\_SU, and add condition "FORMAT is S1G\_DUP\_2M and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE" in the 2nd row. | ACCEPT.Refer to 13/1049r0. |
| <Discussion>As commenter pointed out, MU is only available when long preamble is used with >=2MHz bandwidth.  **TGah editor: modify the D0.2 text from P205L29, as follows**

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| MU\_SU | FORMAT is S1G and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE and (CH\_BANDWIDTH is CBW2 or CBW4 or CBW8 or CBW16)  | Determine whether MU or SU of the S1G PPDUEnumerated type:Set to MU if NUM\_USERS is 2 to 4.Set to SU if NUM\_USERS is 1. | Y | Y |
| FORMAT is S1G\_DUP\_2M and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE | Determine whether MU or SU of the S1G PPDUEnumerated type:Set to MU if NUM\_USERS is 2 to 4.Set to SU if NUM\_USERS is 1. | Y | Y |
| FORMAT is S1G and CH\_BANDWIDTH equals CBW1 | Set to SU. | Y | Y |
| FORMAT is S1G\_DUP\_1M | Set to SU. | Y | Y |
| Otherwise | Not present |

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| 284 | Li Chia Choo | 24.2.2 | 191 | 12 | In Table 24-1, the reference to the MUExclusive Beamforming Report field is not defined. | Line 12 should be edited to reflect the proper reference of the MU Exclusive Beamforming Report field, instead of 8.4.x.x. | ACCEPT.Refer to 13/1049r0. |
| 197 | Hongyuan Zhang | 24.2.2 | 191 | 3 | 8.4.x.x ? | Replaced with true clause numbers for DELTA\_SNR | ACCEPT.Refer to 13/1049r0. |
| 283 | Li Chia Choo | 24.2.2 | 191 | 4 | In Table 24-1, the reference to the MUExclusive Beamforming Report field is not defined. | Line 4 should be edited to reflect the proper reference of the MU Exclusive Beamforming Report field, instead of 8.4.x.x. | ACCEPT.Refer to 13/1049r0. |
| 198 | Hongyuan Zhang | 24.2.2 | 191 | 3 | MU-SU is for packet format, not for sounding request. I guess here it means that DELTA\_SNR is present only for MU feedback. | Remove MU\_SU conditions, copy the same language from 11ac D5.0 for DELTA\_SNR. | REVISE.Refer to 13/1049r0. |
| <Discussion>Regarding CID 283, 284 and 197, the exact reference for MU Exclusive Beamforming Report Field is clause 8.4.1.49 based on 802.11ac Draft 6.0.Regarding CID198, while DELTA\_SNR is used for MU-MIMO transmission of beamformed packets, its information is included in the beamforming report frame by beamformee. So, MU\_SU condition is not proper for the report as commenter pointed out. **TGah editor: modify the D0.2 text from P212L02, as follows**

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| DELTA\_SNR | FORMAT is S1G and (CH\_BANDWIDTH is CBW2 or CBW4 or CBW8 or CBW16) | Contains an array of delta SNR values as defined in 8.4.1.49 (MU Exclusive Beamforming Report field) based on the channel measured during the training symbols of the received S1G NDP PPDU.NOTE—In the RXVECTOR this parameter is present only for S1G NDP PPDUs for MU sounding. | MU | Y |
| FORMAT is S1G\_DUP\_2M  | Contains an array of delta SNR values as defined in 8.4.1.49 (MU Exclusive Beamforming Report field) based on the channel measured during the training symbols of the received S1G NDP PPDU.NOTE—In the RXVECTOR this parameter is present only for S1G NDP PPDUs for MU sounding. | MU | Y |
| FORMAT is S1G and (CH\_BANDWIDTH is CBW2 or CBW4 or CBW8 or CBW16) | Not present | N | N |
| FORMAT is S1G\_DUP\_1M | Not present | N | N |
| Otherwise | See corresponding entry in Table 20-1 and Table 22-1. |

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| 199 | Hongyuan Zhang | 24.2.2 | 193 | 31 | "S1G-LTF" is not defined | Change to "LTF field" | ACCEPT.Refer to 13/1049r0. |
| <Discussion>Matched to the currently defined termology in clause 24.3. **TGah editor: modify the D0.2 text from P214L27, as follows**

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| RSSI | FORMAT is S1G | The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antennas used to receive the current PPDU measured during the reception of the LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power. | N | Y |
| FORMAT is S1G\_DUP\_2M | The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antennas used to receive the current PPDU measured during the reception of the LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power. | N | Y |
| FORMAT is S1G\_DUP\_1M | The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antennas used to receive the current PPDU measured during the reception of the LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power. | N | Y |
| Otherwise | See corresponding entry in Table 20-1 and Table 22-1. |

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| 189 | Hongyuan Zhang | 24.2.2 | 199 | 3 | Beam Chage is now Beam change/Smoothing according to the motions passed with the presentation "11-13-0497-00-00ah-TGah-Miscellaneous-PHY-Updates". | revise Tx/Rx vector according to the presentation, this includes changes in both BEAM\_CHANGE and SMOOTHING primitives. | REVISE.Refer to 13/1049r0. |
| <Discussion>By motions passed in "11-13-0497-00-00ah-TGah-Miscellaneous-PHY-Updates", beam change bit is set to 1 when* >= 2MHz long preamble packet for Nsts=1

FYI, smoothing bit may be set to 1 by implementer’s decision when* 1MHz preamble packet
* >= 2MHz short preamble packet
* >= 2MHz long preamble packet (if Nsts >1, smoothing is more recommended)

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| **TGah editor: modify the D0.2 text from P220L03, as follows**

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| BEAM\_CHANGE | FORMAT is S1G and MU\_SU equals SU and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE and NUM\_STS is 1. | Set to 1 if the Q matrix is changed from the Omni portion to the Data portion of the long preamble, in at least one of the non-zero sub-carrier of the Omni portion as described in 24.3.8.2.2.1.4.Set to 0 if the Q matrix is unchanged in all the non-zero sub-carriers of the Omni portion. NOTE—If BEAM\_CHANGE is 0 and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE, the receiver may do channel smoothing. Otherwise, smoothing is not recommended.  | Y | Y |
| FORMAT is S1G\_DUP\_2M and MU\_SU equals SU and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE and NUM\_STS is 1. | Set to 1 if the Q matrix is changed from the Omni portion to the Data portion of the long preamble, in at least on of the non-zero sub-carrier of the Omni portion as described in 24.3.8.2.2.1.4.Set to 0 if the Q matrix is unchanged in all the non-zero sub-carriers of the Omni portion. NOTE—If BEAM\_CHANGE is 0 and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE, the receiver may do channel smoothing. Otherwise, smoothing is not recommended.  | Y | Y |
| Otherwise | Not present | N | N |

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| **TGah editor: modify the D0.2 text from P207L03, as follows**

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| SMOOTHING | FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and PREAMBLE\_TYPE equals S1G\_SHORT\_PREAMBLE | Indicates whether frequency-domain smoothing is recommended as part of channel estimation.Set to 1 if frequency-domain smoothing is recommended.Set to 0 otherwise. | Y | Y |
| FORMAT is S1G\_DUP\_2M and PREAMBLE\_TYPE equals S1G\_SHORT\_PREAMBLE | Indicates whether frequency-domain smoothing is recommended as part of channel estimation.Set to 1 if frequency-domain smoothing is recommended.Set to 0 otherwise. | Y | Y |
| FORMAT is S1G\_DUP\_1M | Indicates whether frequency-domain smoothing is recommended as part of channel estimation.Set to 1 if frequency-domain smoothing is recommended.Set to 0 otherwise. | Y | Y |
| FORMAT is S1G and CH\_BANDWIDTH equals CBW1 | Indicates whether frequency-domain smoothing is recommended as part of channel estimation.Set to 1 if frequency-domain smoothing is recommended.Set to 0 otherwise. | Y | Y |
| FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE | If NUM\_STS is larger than 1, indicates whether frequency-domain smoothing is recommended as part of channel estimation.Set to 1 if frequency-domain smoothing is recommended.Set to 0 otherwise. | Y | Y |
| FORMAT is S1G\_DUP\_2M and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE | If NUM\_STS is larger than 1, indicates whether frequency-domain smoothing is recommended as part of channel estimation.Set to 1 if frequency-domain smoothing is recommended.Set to 0 otherwise. | Y | Y |
| Otherwise | See corresponding entry in Table 20-1 and Table 22-1.  |

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| 721 | Ronald Murias | 24.2.3 | 201 | 17 | It is not clear on which signal the frequency rotation of 90 degree is applied. | Clarify on which signal the frequency rotation is applied. | REVISE.Refer to 13/1049r0. |
| 722 | Ronald Murias | 24.2.3 | 201 | 38 | Should the rotation be applied to the fifth channel, in addition to the "second, third, fourth, sixth, seventh and eighth channels"? | If the rotation should be applied to the fifth channel, include it in the list. If the rotation is not to be applied to the fifth channel, explain why. | REVISE. Refer to 13/1049r0. |
| 723 | Ronald Murias | 24.2.3 | 201 | 56 | Text sates that phase rotation for each 1MHz channel in DUP mode is TBD but also says it's defined in Equation 24-9. 24-9 describes a 2MHz transmission using 1 MHz duplicated mode, which seems correct. Is there something missing? | Check the reference. It's not clear if the TBD is a placeholder for specific values or it's a leftover from editorial work. | ACCEPT.Refer to 13/1049r0. |
| 236 | Jianhan Liu | 24.2.3 | 217 | 11 | What is difference of "SIG\_DUP\_2M" in "CBW2" and "SIG" in "CBW2"? They are the same format. | Should we remove the "SIG\_DUP\_2M" in CBW2 since there is already a "SIG" in CBW2? | ACCEPT.Refer to 13/1049r0. |
| <Discussion>Regarding CID 721 and 722, modified its expression to make it easily understandable. Regarding CID 236, SIG\_DUP\_2M in CBW2 and SIG\_DUP\_1M in CBW1 are deleted according to the comment. Regardig CID 723, by motions passed by “11-13-0521-00-00ah-phase-rotations-for-1mhz-dup-mode”, phase rotation pattern for 1MHz duplicate transmission is newly defined as in the followings:  |
| **TGah editor: modify the D0.2 text from P222L03, as follows**

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| * PPDU format as a function of CH\_BANDWIDTH parameter
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| FORMAT | CH\_BANDWIDTH | PPDU format |
| S1G | CBW1 | The STA transmits an S1G PPDU of 1 MHz bandwidth. If the operating channel width is wider than 1 MHz, then the transmission shall use the primary 1 MHz channel. |
| S1G | CBW2 | The STA transmits an S1G PPDU of 2 MHz bandwidth. If the operating channel width is wider than 2 MHz, then the transmission shall use the primary 2 MHz channel. |
| S1G | CBW4 | The STA transmits an S1G PPDU of 4 MHz bandwidth. If the operating channel width is wider than 4 MHz, then the transmission shall use the primary 4 MHz channel. |
| S1G | CBW8 | The STA transmits an S1G PPDU of 8 MHz bandwidth. If the operating channel width is wider than 8 MHz, then the transmission shall use the primary 8 MHz channel. |
| S1G | CBW16 | The STA transmits an S1G PPDU of 16 MHz bandwidth. |
|  |  |  |
| S1G\_DUP\_2M | CBW4 | The STA transmits an S1G 2 MHz Duplicate PPDU using two adjacent 2 MHz channels as defined in 24.3.9.12.2 (2MHz duplicate transmission). If the operating channel width is wider than 4 MHz, then the transmission shall use the primary 4 MHz channel. Phase rotation pattern for each 2MHz channel is [1 j] from the lowest frequency as defined in Equation (24-6). |
| S1G\_DUP\_2M | CBW8 | The STA transmits an S1G 2 MHz Duplicate PPDU using four adjacent 2 MHz channels as defined in 24.3.9.12.2 (2MHz duplicate transmission). If the BSS operating channel width is 16 MHz, then the transmission shall use the primary 8 MHz channel. Phase rotation pattern for each 2MHz channel is [1 -1 -1 -1] from the lowest frequency as defined in Equation (24-7). |
| S1G\_DUP\_2M | CBW16 | The STA transmits an S1G 2 MHz Duplicate PPDU using eight adjacent 2 MHz channels as defined in 24.3.9.12.2 (2MHz duplicate transmission). Phase rotation pattern for each 2MHz channel is [1 -1 -1 -1 1 -1 -1 -1] from the lowest frequency as defined in Equation (24-8). |

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| **TGah editor: modify the D0.2 text from P222L53, as follows**

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| S1G\_DUP\_1M | CBW2 | The STA transmits an S1G 1 MHz Duplicate PPDU using two adjacent 1 MHz channels as defined in 24.3.9.12.1 (1MHz duplicate transmission). If the operating channel width is wider than 2 MHz, then the transmission shall use the primary 2 MHz channel. Phase rotation pattern for each 1MHz channel is [1 -1] from the lowest frequency as defined in Equation (24-9). |
| S1G\_DUP\_1M | CBW4 | The STA transmits an S1G 1 MHz Duplicate PPDU using four adjacent 1 MHz channels as defined in 24.3.9.12.1 (1MHz duplicate transmission). If the operating channel width is wider than 4 MHz, then the transmission shall use the primary 4 MHz channel. .Phase rotation pattern for each 1MHz channel is [1 j –j -1] from the lowest frequency as defined in Equation (24-10). |
| S1G\_DUP\_1M | CBW8 | The STA transmits an S1G 1 MHz Duplicate PPDU using eight adjacent 1 MHz channels as defined in 24.3.9.12.1 (1MHz duplicate transmission). If the BSS operating channel width is 16 MHz, then the transmission shall use the primary 8 MHz channel. Phase rotation pattern for each 1MHz channel is [1 -1 1 1 1 1 -1 -1] from the lowest frequency as defined in Equation (24-11). |
| S1G\_DUP\_1M | CBW16 | The STA transmits an S1G 1 MHz Duplicate PPDU using sixteen adjacent 1 MHz channels as defined in 24.3.9.12.1 (1MHz duplicate transmission).  Phase rotation pattern for each 1MHz channel is [1 1 1 -1 1 1 1 -1 -1 -1 1 -1 1 1 -1 1] from the lowest frequency as defined in Equation (24-12). |

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| **TGah editor: modify the D0.2 text from P216L03, as follows**

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| CH\_BANDWIDTH | FORMAT is S1G | Indicates the channel width of the transmitted PPDU:Enumerated type: CBW1 for 1 MHzCBW2 for 2 MHzCBW4 for 4 MHzCBW8 for 8 MHzCBW16 for 16 MHz | Y | Y |
| FORMAT is S1G\_DUP\_2M | In TXVECTOR, indicates the channel width of the transmitted 2MHz Duplicate PPDU.In RXVECTOR, indicates the estimated channel width of the 2MHz Duplicate received PPDU.Enumerated type:CBW4 for 4 MHzCBW8 for 8 MHzCBW16 for 16 MHz | Y | Y |
| FORMAT is S1G\_DUP\_1M | In TXVECTOR, indicates the channel width of the transmitted 1MHz Duplicate PPDU.In RXVECTOR, indicates the estimated channel width of the 1MHz Duplicate received PPDU.Enumerated type: CBW2 for 2 MHzCBW4 for 4 MHzCBW8 for 8 MHzCBW16 for 16 MHz | Y | Y |
| Otherwise | See corresponding entry in Table 20-1 and Table 22-1. |

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