IEEE P802.11  
Wireless LANs

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| D0.1 Comment Resolution, | | | | |
| Date: 2011-05-05 | | | | |
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**Comments relative to D0.1**

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| 891 | Porat, Ron | 7.3.1.33 | 24 | 23 | TR | The definition of N should be more tightly related to the average SNR per stream | Change line to: "is the average noise plus interference power measured at the beamformee that was used to calculate |

**Proposed resolution: Accept**

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| 766 | Liu, Yong | 7.3.1.34 | 28 | 33 | TR | What does the sentence "when an MU type feedback is used to do the transmission" mean? Also, the following paragraph is duplicated. |

**Proposed resolution:**

Change senstence in the table to “Set to 1 if Rx Nss indicates the maximum number of spatial streams the beamformee can receive in a single user beamformed transmission when feedback type = 1 (as defined in table 7-2) was used to calculate the beamforming steering matrix”

Remove the sentence below the table ” If Max Nss For SU Present is set to 1, bits Rx Nss indicates the maximum number of spatial streams the beamformee can receive in a single user beamformed transmission when an MU type feedback is used to do the transmission.”

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| 151 | Banerjea, Raja | 22.3.19.2 | 139 | 48 | TR | Either define the number of symbols to average spectral flatness over or if the number of symbols is not necessary remove it. |

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| 1310 | Stephens, Adrian | 22.3.19.2 | 139 | 48 | TR | There's a TBD |
| 1705 | Cheong, Minho | 22.3.19.2 | 139 | 48 | TR | Why not setting this TBD VHT data symbols for calculation of the average constellation energy per each carrier, to be the same duration to that of EVM test, that is 16 OFDM data symbols? |

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| 491 | Hart, Brian | 22.3.19.2 | 139 | 51 | TR | Information in this section would be better presented via a table |

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| 152 | Banerjea, Raja | 22.3.19.2 | 140 | 19 | TR | Do we need to define if the averaging is performed over the linear or log domain? If we need to define "All averaging performed in this section is performed in dB." |

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| 1188 | Stanley, Dorothy | 22.3.19.2 | 140 | 19 | TR | Resolve editor note re: averaging used. |

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| 883 | Pillai, Krishna | 22.3.19.2 | 140 | 24 | TR | "The tests for the spectral flatness requirements can be performed with spatial mapping" Change 'can be performed' to 'shall be performed' |

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**Proposed resolution:**

Replace section 22.3.19.2 with the text below:

**22.3.19.2 Spectral flatness**

Spectral flatness measurements shall be conducted using BPSK modulated packets.

Let *Ei,avg* denote the average constellation energy of a BPSK modulated subcarrier *i* in a VHT data symbol.

In a contiguous transmission having a bandwidth listed in Table 22-18a, *Ei,avg* of each of the subcarriers with indices listed as tested subcarrier indices shall not deviate by more than the specified maximum deviation in Table 22-18a from the average of *Ei,avg* over subcarrier indices listed as averaging subcarrier indices.

Averaging of *Ei,avg* is done in the linear domain.

In a non-contiguous transmission consisting of two 80 MHz frequency segments nonadjacent in frequency,

each segment shall meet the spectral flatness requirement for an 80 MHz transmission.

The tests for the spectral flatness requirements shall be performed with spatial mapping *Qk* = **I** (see

22.3.11.10).

Table 22-18a: Maximum transmit spectral flatness deviations

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| Bandwidth of transmission (MHz) | Averaging subcarrier indices (inclusive) | Tested subcarrier indices (inclusive) | Maximum deviation (dB) |
| 20 | -16 to -1 and +1 to +16 | -16 to -1 and +1 to +16 | ± 4 |
| –28 to –17 and +17 to +28 | +4/–6 |
| 40 | -42 to -2 and +2 to +42 | –42 to –2 and +2 to +42 | ± 4 |
| –43 to –58 and +43 to +58 | +4/–6 |
| 80 | -84 to -2 and +2 to +84 | –84 to –2 and +2 to +84 | ± 4 |
| –122 to –85 and +85 to +122 | +4/–6 |
| 160 | -250 to -6 and +6 to +250 | –250 to –6 and +6 to +250 | +4/–6 |
| Non-HT Duplicate | –42 to –33, –31 to –6, +6 to +31, and +33 to +42 | –42 to –33, –31 to –6, +6 to +31, and +33 to +42 | ± 4 |
| –43 to –58 and +43 to +58 | +4/–6 |
| 80MHz Non-HT Duplicate | -84 to -70,-58 to -33, -31 to -6, +6 to +31, +33 to +58, +70 to +84 | -84 to -70,-58 to -33, -31 to -6, +6 to +31, +33 to +58, +70 to +84 | ± 4 |
| –122 to -97, -95 to –85 and +85 to +95, +97 to +122 | +4/–6 |

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| 1699 | Cheong, Minho | 22.3.19.3 | 140 | 30 | TR | how about having a note on the definition of ppm? |
| 1698 | Cheong, Minho | 22.3.19.3 | 140 | 35 | TR | It is depending on vendors' option whether two carriers are used or only one carrier is used for contiguous 160MHz and non-contiguous 80+80 transmissions. So, it seems better to add this explanatory note to this sentence: 'if each 80MHz segments is transmitted with the use of separete carrier' |

**Proposed resolution:**

Change line 30 to: The transmitter center frequency maximum allowable deviation shall be ±20 parts per million (ppm) – or equivalently 0.002%.

Change second paragraph in the section to:

If two separate LO are used to generate the lower and upper 80 MHz frequency portions of a transmit signal with CH\_BANDWIDTH parameter in the TXVECTOR set to HT\_CBW160, HT\_CBW80+80, NON\_HT\_CBW160 or NON\_HT\_CBW80+80 their phase shall not be required to be correlated.

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| 493 | Hart, Brian | 22.3.19.4 | 140 | 43 | TR | Signal extension is only required for 2.4 GHz, but 11ac is prohibited from operation in this band  Is this section even needed? Or at least note that it has no impact. |

**Proposed resolution:**

Remove the section. CCK is not part of this amendment and therefore not needed.

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| 1700 | Cheong, Minho | 22.3.19.6.3 | 141 | 9 | TR | needs a explanatory note  N\_SS=N\_STS (no STBC) |

**Proposed resolution:**

Accept suggested remedy: add (no STBC).

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| 494 | Hart, Brian | 22.3.19.6.4 | 141 | 40 | TR | Non-contiguous is an exception to the previous para, so need to run them together "being transmitted; excepting that for non-contiguous …" |

**Proposed resolution:**

Accept. Add to line 37 : “...except for non-contiguous transmission”

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| 496 | Hart, Brian | 22.3.19.6.4 | 141 | 54 | TR | One sample resolution is overkill of a 160 MHz packet, given that the GI duration hasn't changed. And many implementations process the primary only  change to "with 50 ns resolution" |

**Proposed resolution:**

Remove text: “(with one sample resolution)”. No need to specify resolution of timing acquisition.

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| 905 | Pulikkoonattu, Rethna | 22.3.19.6.4 | 142 | 9 | TR | How about adding a clause on EVM measurement on the normalization? Say for instance, i) Approporate normalization of the constellation is performed before computing the RMS  This is kind of already done and may be obvious. An explicit addition may provide a means to quantify the constellation error for not only additive noise, but others too such as phase noise and various known RF impairments. |
| 1703 | Cheong, Minho | 22.3.19.6.4 | 142 | 11 | TR | There is no definition of N\_f  needs to add its definition or delete this expression |
| 1704 | Cheong, Minho | 22.3.19.6.4 | 142 | 12 | TR | There is ambiguity on what this number means  at least 16 data OFDM symbols long |

**Proposed resolution:**

**905 –** Reject.

“Appropriate normalization” would hide RF impairments maybe even wrong implementations, e.g. LTF fields is 3dB lower than payload.

**1703**

Change in line 10 : (Nf as defined in formula 20-89)

**1704**

Change in line 12 : At least 16 data OFDM symbols long

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| 488 | Hart, Brian | 22.3.19.1 | 136 | 58 | TR | The mask is defined with reference to the max PSD of the signal. In 11ac, we have introduced sloppier flatness requirements which allowsthe peak PSD to rise above the mean by 4 dB. So for devices with +4dB peaks, the mask requirements are loosened (higher slidelobes) by 2dB. This a) creates moral risk that vendors will be tempted to create a 4dB peak, and b) was not an identified issue during tecnhical discussions  Change the spectral mask reference to min(maxPSD,mean(PSD[central subcarriers as listed in 22.13.19.2])+2). Repeat for 20/40/80/160 MHz |

**Proposed resolution:**

Reject. Simulation results in (11-11-0668-00-00ac) show negligible degradation. Hence no need to change text.

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| 213 | Erceg, Vinko | 22.3.19.6.3 | 141 | 27 | TR | Change EVM requirement for 64\_qam rate 5/6 from -28dB to -27dB. |

**Proposed resolution:**

Accept. The performance gap to 64QAM rate ¾ is only 1.3dB (based on contribution 11-11-0029-00-00ac) and doesn’t justify tightening EVM by 3dB

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| 1312 | Stephens, Adrian | 22.3.19.6.2 | 140 | 65 | TR | There's a TBD |

**Proposed resolution:**

Replace current text with:

TX LO leakage shall meet the following requirements for all bandwidth except non-contiguous 80+80MHz:

* When RF LO is in the center of the transmitted PPDU BW, the power measured at the center of transmission BW using resolution BW 312.5KHz shall not exceed the average power per-subcarrier of the transmitted PPDU, or equivalently, (P – 10\*log10(N)), where P is the total transmit power and N is the number of data plus pilot tones
* When the RF LO is not at the center of the transmitted PPDU BW, the power measured at the location of the RF LO using resolution BW 312.5KHz shall not exceed the maximum of –32dB relative to the total transmit power and –20 dBm, or equivalently max(P – 32,  – 20), where P is the total transmit power

For non-contiguous transmission using nonadjacent 80MHz channels where the RF LO falls outside both channels, the RF LO shall follow the spectral mask requirements as defined in 22.3.19.1.

Add the following sentence to section 22.3.19.1 page 136:

Note 3: For rules regarding TX center frequency leakage levels see section 22.3.19.6.2