IEEE P802.11  
Wireless LANs

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| 802.11  [802.11az PHY Spec Text for Under 7GHz]  (relative to REVmd D0.5) | | | | |
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**Abstract**

This submission proposes P802.11az draft amendment text for the P802.11az Negotiation Protocol. The baseline documents that this proposal depends on are:

1. D0.05 of REVmd
2. D8.0 of PIEEE802.11aj
3. D5.0 of PIEEE802.11ak
4. D13.0 of PIEEE802.11aq

History:

R0: Initial Version

***TGaz Editor: Insert the following subclauses after 28.3.17 (HE TB NDP feedback PPDU):***

**28.3.17a HEz SU sounding NDP PPDU**

When the TXVECTOR parameter LTF\_SEQUENCE is not present, the format of an HEz SU sounding NDP PPDU is shown in Figure 28-44 (HE NDP PPDU format). It is mandatory to support 2x HE-LTF with *TGI1,Data*and 2x HE-LTF with *TGI2,Data*. The other combinations of HE-LTF modes and GI durations are disallowed.

When the TXVECTOR parameter LTF\_SEQUENCE is present, the HEz-LTF field and the Packet Extension (PE) field shall have a zero power guard interval and the length of the zero power guard interval of PE is equal to the length of the zero power guard interval of the HEz-LTF symbols. The format of an HEz SU sounding NDP PPDU with zero power guard interval is shown in Figure 28-aa.



Figure 28-aa HEz SU sounding NDP PPDU format with zero power GI

When the TXVECTOR parameter LTF\_SEQUENCE is present, the HEz-LTF sequence is generated as the following:

— In a 20 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-122:122] of an HEz SU sounding NDP is given by:

TBD

— In a 40 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-244:244] of an HEz SU sounding NDP is given by:

TBD

— In a 80 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-500:500] of an HEz SU sounding NDP is given by:

TBD

— In a 160/80+80 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-500:500] of each 80 MHz frequency segment of an HEz SU sounding NDP is given by:

TBD

When the TXVECTOR parameter LTF\_SEQUENCE is present, the time domain representation of the waveform of the HEz-LTF is described in Equation (28-58) with replacing the *TGI1,Data, TGI2,Data* with zero power guard interval and replacing the HE-LTF sequence with HEz-LTF sequence on each subcarrier.

The detailed format for the HEz SU sounding NDP with multiple HEz-LTF fields is TBD.

At the receiver the mechanism (e.g. DFT size) by which the time domain signal is transformed to frequency domain signal based on an HEz-LTF field with zero power guard interval is implementation specific.

**28.3.17a.1 HEz TB sounding NDP PPDU**

When the TXVECTOR parameter LTF\_SEQUENCE is not present, the format of an HEz TB sounding NDP PPDU is shown in Figure 28-cc (HEz TB sounding NDP PPDU format).



Figure 28-cc HEz TB sounding NDP PPDU format

The HEz TB sounding NDP PPDU has the following properties:

— Uses the HE TB PPDU format but without the Data field.

— Has Packet Extension field that is 4us in duration.

It is mandatory to support 2x HE-LTF with *TGI2,Data*. The other combinations of HE-LTF modes and GI durations are disallowed.

When the TXVECTOR parameter LTF\_SEQUENCE is not present, the time domain representation of the waveform of the HEz-LTF is described in Equation (28-59).

When the TXVECTOR parameter LTF\_SEQUENCE is present, the HEz-LTF field and PE field shall have a zero power guard interval and the length of the zero power guard interval of PE is equal to the length of the zero power guard interval of the HEz-LTF symbols. The format of an HEz TB sounding NDP PPDU with zero power guard interval is shown in Figure 28-dd.



Figure 28-dd HEz TB sounding NDP PPDU format with zero power GI

When the TXVECTOR parameter LTF\_SEQUENCE is present, the HEz-LTF sequence is generated as the following:

— In a 20 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-122:122] of an HEz TB sounding NDP is given by:

TBD

— In a 40 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-244:244] of an HEz TB sounding NDP is given by:

TBD

— In an 80 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-500:500] of an HEz TB sounding NDP is given by:

TBD

— In a 160/80+80 MHz transmission, the HEz-LTF sequence transmitted on subcarriers [-500:500] of each 80 MHz frequency segment of an HEz TB sounding NDP is given by:

TBD

When the TXVECTOR parameter LTF\_SEQUENCE is present, the time domain representation of the waveform of the HEz-LTF is described in Equation (28-59) with replacing the *TGI2,Data* with zero power guard interval and replacing the HE-LTF sequence with HEz-LTF sequence on each subcarrier.

When the TXVECTOR parameter LTF\_SEQUENCE is present and LTF\_SEQUENCE parameter has multiple LTF sequence generation information, the format of an HEz TB sounding NDP PPDU is shown in Figure 28-ee. Each HEz-LTF field is generated using a different random HEz-LTF sequence, and each HEz-LTF symbol is generated with zero power guard interval. P-matrix encode is used for each HEz-LTF field for the multiple Tx antenna case. An NDP with multiple HEz-LTF fields may be used by a single STA to obtain independent channel estimates based on each HEz-LTF field. The PHY shall issue the error condition PHY-RXEND.indication(Integrity Check Error) primitive if the PHY detects the integrity check error.

 Figure 28-ee HEz TB sounding NDP PPDU with *NLTF* HEz-LTF fields

At the receiver the mechanism (e.g. DFT size) by which the time domain signal is transformed to frequency domain signal based on an HEz-LTF field with zero power guard interval is implementation specific.

***TGaz Editor: Insert the following subclause after 21.3.12 (VHT preamble format for sounding PPDUs):***

**21.3.12a VHTz sounding NDP PPDU**

When the TXVECTOR parameter LTF\_SEQUENCE is not present, the format of a VHTz sounding NDP PPDU is shown in Figure 21-28 (VHT NDP format).

When the TXVECTOR parameter LTF\_SEQUENCE is present, the format of a VHTz sounding NDP PPDU is TBD.

When the TXVECTOR parameter LTF\_SEQUENCE is present, the VHTz-LTF sequence is generated as the following:

— In a 20 MHz transmission, the VHTz-LTF sequence transmitted on subcarriers [-28:28] of a VHTz SU sounding NDP is given by:

TBD

— In a 40 MHz transmission, the VHTz-LTF sequence transmitted on subcarriers [-58:58] of a VHTz SU sounding NDP is given by:

TBD

— In an 80 MHz transmission, the VHTz-LTF sequence transmitted on subcarriers [-122:122] of a VHTz SU sounding NDP is given by:

TBD

— In a 160 MHz transmission, the VHTz-LTF sequence transmitted on subcarriers [-250:250] of a VHTz SU sounding NDP is given by:

TBD

— In an 80+80 MHz transmission, the VHTz-LTF sequence transmitted on each 80 MHz frequency segment is TBD

When the TXVECTOR parameter LTF\_SEQUENCE is present and LTF\_SEQUENCE parameter has multiple LTF sequence generation information, the format of a VHTz sounding NDP PPDU is TBD.