IEEE P802.11  
Wireless LANs

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Constant Tx power for HE Ranging NDP and HE TB Ranging NDP | | | | | | Date: 2021-06-22 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Anuj Batra | Apple Inc. |  |  | Anuj.batra@apple.com | | Tianyu Wu | Apple Inc. |  |  |  | | Qi Wang | Apple Inc. |  |  |  | | Ali Raissinia | Qualcomm |  |  |  | | Steve Shellhammer | Qualcomm |  |  |  | | Bin Tian | Qualcomm |  |  |  | | Nehru Bhandaru | Broadcom |  |  |  | | Manas Deb | Broadcom |  |  |  | | Vinko Erceg | Broadcom |  |  |  | | Gadi Shor | Intel |  |  |  | | Robert Stacey | Intel |  |  |  | |

**Discussion**

In page 224, line 15 of IEEE 802.11az D3.0, the draft explicitly states “if NSTS < NTx, Q matrix shall be based on antenna selection matrix with no antenna swapping. Q matrix becomes an Identity matrix when all 0 rows are removed.”

For N\_Tx = 2 and N\_STS = 1 case: Q = implies that the HE modulated fields will only use the first Tx chain. However, the draft does not describe how to transmit the pre-HE modulated fields.

In IEEE 802.11ax, the pre-HE modulated fields may be transmitted using 2 Tx chains with CSDs.

Diagram

Description automatically generated

*IEEE 802.11ax transmitter diagram for pre-HE modulated fields*

For IEEE 802.11az, there are two possible options for pre-HE modulated fields:

Option 1:

* Use IEEE 802.11ax to construct the pre-HE modulated fields (suggests two Tx chains, but possible to use only one Tx chain)
* Use IEEE 802.11az to construct HE modulated fields (first Tx chain) with **3 dB power boost to maintain constant power**



Option 2:

* Use IEEE 802.11az to construct pre-HE and HE modulated fields, i.e., use first Tx chain for both fields with **no power boost required:**



Both option 1 and option 2 work if the power boost for HE modulated fields are handled correctly. We propose to clarify these two options for pre-HE modulated fields and add text to ensure that the total power shall remain constant throughout the HE Ranging NDP.

**Proposed Text Updates:**

*Instruction to TGaz Editor: Make the following text change at D3.0 P226, L11.*

The Secure HE-LTF for each user are concatenated one after another to a maximum of 64 Secure HE-LTF.

In the HE modulated fields, the number of Tx antennas are the same as the N\_STS in each user’s HE-LTF segment and may vary from one segment to the other due to N\_STS change.  In the pre-HE modulated fields, the number of Tx antennas shall be no less than the minimum number of Tx antennas used in the HE modulated fields.  The sum of the Tx power across all Tx antennas shall remain constant throughout the entire HE Ranging NDP PPDU.

*Instruction to TGaz Editor: Make the following text change at D3.0 P227, L15.*

The number of HE-LTF symbols in an HE TB Ranging NDP is the product of the usual number of HE-LTF symbols N\_HE\_LTF and the number of LTF repetitions LTF\_REP. The sum of Tx power shall remain constant throughout the entire HE TB Ranging NDP PPDU.