***Proposal 3.4b:***

For partially coherent uplink precoding by an 8TX UE codebook, Ng=4,

* Following rank cases are supported,
* Down-select number of permutations for each cases based on the potential use-case, performance, and overall DCI overhead

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| --- | --- | --- | --- |
| *Rank* | *All layers in one Antenna Group* | *Layers split across 4 Antenna Groups**(All possible permutations)* | *Supported permutations* |
| *2* | *
 | *Transmission by 2 of the 4 antenna groups:**(1,1,0,0), (1,0,1,0), (1,0,0,1)**(0,1,1,0), (0,1,0,1), (0,0,1,1)* | * Ericsson: No pruning; use permutations shown.
* vivo: keep it all possible combinations and potentially down-select next when the proposals on precoders are clear
* OPPO: Agreed.
 |
| *3* |  | *Transmission by 2 of the 4  antenna groups:**(2,1,0,0), (2,0,1,0), (2,0,0,1)**(1,2,0,0), (0,2,1,0), (0,2,0,1)**(1,0,2,0), (0,1,2,0), (0,0,2,1)**(1,0,0,2), (0,1,0,2), (0,0,1,2)**Transmission by 3 of the 4  antenna groups:**(1,1,1,0), (1,1,0,1), (1,0,1,1), (0,1,1,1)* | * Ericsson: No pruning; use permutations shown.
* vivo: keep it all possible combinations and potentially down-select next when the proposals on precoders are clear
* OPPO: We think selection of antenna port group is more important than allocation of layers to selected antenna port group. For 2 groups, (2,1,0,0), (2,0,1,0), (2,0,0,1) (0,2,1,0), (0,2,0,1) (0,0,2,1) can be prioritized and others can be considered for overhead reduction.
 |
| *4* |  | *Transmission by 2 of  the 4  antenna groups:**(2,2,0,0), (2,0,2,0), (2,0,0,2)**(0,2,2,0), (0,2,0,2), (0,0,2,2)* | * Ericsson: No pruning; use permutations shown.
* vivo: keep it all possible combinations and potentially down-select next when the proposals on precoders are clear
* OPPO: Fine.
 |
| *5* | *
 | *Transmission by 3 of the antenna groups:**(2,2,1,0), (2,2,0,1), (2,1,2,0), (2,1,0,2), (2,0,1,2), (2,0,2,1), (0,2,2,1), (0,2,1,2), (1,2,2,0), (1,2,0,2)**(0,1,2,2), (1,0,2,2)**Transmission by 2 of the 4 antenna groups:**(1,1,2,1), (1,1,1,2)* | * Ericsson: support only (1,1,2,1), (1,1,1,2); and (2,0,2,1), (0,2,1,2)
* vivo: keep it all possible combinations and potentially down-select next when the proposals on precoders are clear
* OPPO: It should be “Transmission by 4 antenna groups”. We think selection of antenna port group is more important than allocation of layers to selected antenna port group. For 3 groups, (2,2,1,0), (2,2,0,1), (2,0,2,1), (0,2,2,1) can be prioritized and others can be considered for overhead reduction. For 4 groups, one of the permutations may be sufficient for such a high rank.
 |
| *6* | *
 | *Transmission by 3 of the 4 antenna groups:**(2,2,2,0), (2,2,0,2), (2,0,2,2), (0,2,2,2)**Transmission by four antenna groups:**(2,1,2,1), (1,2,1,2)* | * Ericsson: support only (2,1,2,1), (1,2,1,2); this saves 32 out of 160 precoders (without other optimizations)
* vivo: keep it all possible combinations and potentially down-select next when the proposals on precoders are clear
* OPPO: We think selection of antenna port group is more important than allocation of layers to selected antenna port group. For 4 groups, one of the permutations may be sufficient for such a high rank.
 |
| *7* |  | *(2,2,2,1), (2,2,1,2), (2,1,2,2), (1,2,2,2)* | * Ericsson: support only (2,1,2,2), (1,2,2,2); this saves 64 out of 128 precoders (without other optimizations)
* vivo: keep it all possible combinations and potentially down-select next when the proposals on precoders are clear
* OPPO: We think one of the permutations may be sufficient for such a high rank.
 |

*Note: Above is not relevant to how precoders are indicated.*