#### 3GPP TSG RAN WG4 Meeting #103 e **R4-XXXX**

e-meeting, May 09 – May 20, 2022

**Agenda Item:**  9.1.3.3

**Source:** CMCC CAICT

**Title:**  Reference curves for FR2 channel model validation

**Document for:**  Approval

# Introduction

PDP, Temporal Correlation (TC), V/H ratio, and PSP are four parameters defined for FR2 channel model validation. This contribution presents theoretical target values of PDP, TC and PAS for the strongest beam for two FR2 reference channel models, i.e., Umi CDL-C and InO CDL-A. It is noted that the strongest beam direction is defined as specified in Annex D.2 in [1] and the power is the sum of channel gains from two base station sub-arrays with orthogonal ±45° linear polarizations to vertically polarized omni-directional UE antenna, which is presented as X2V in this contribution.

# Details

## UMi CDL-C

Table1 PDP, UMi CDL-C Strongest beam fc = 28 GHz

|  |  |  |
| --- | --- | --- |
| Cluster # | Delay [ns] | X2V Power[dB] |
| 1 | 0  | -24.9201 |
| 2 | 12.5940  | -17.801 |
| 3 | 13.0560  | -29.4597 |
| 4 | 13.3140  | -20.9498 |
| 5 | 13.9740  | -25.0122 |
| 6 | 38.1960 | 0 |
| 7 | 38.6880  | -2.5868 |
| 8 | 39.3600   | -4.0264 |
| 9 | 39.5040  | -38.7139 |
| 10 | 47.6100  | -35.1414 |
| 11 | 49.2780  | -34.3635 |
| 12 | 56.0160  | -40.2129 |
| 13 | 73.7100  | -29.1825 |
| 14 | 78.4980  | -35.7024 |
| 15 | 130.2240  | -38.2426 |
| 16 | 162.6300  | -38.5096 |
| 17 | 255.5340  | -40.3429 |
| 18 | 276.0180  | -42.0004 |
| 19 | 329.4120  | -46.6712 |
| 20 | 336.4620  | -50.4918 |
| 21 | 378.3900  | -50.1961 |
| 22 | 398.2440  | -43.0714 |
| 23 | 422.5620  | -51.4438 |
| 24 | 519.1380  | -58.7794 |



Table2 Autocorrelation, UMi CDL-C Strongest beam fc = 28 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Distance [λ] | X2V Corr. | Distance [λ] | X2V Corr. |
| 0 | 1 | 2.6 | 0.1716 |
| 0.1 | 0.9928 | 2.7 | 0.1648 |
| 0.2 | 0.9716 | 2.8 | 0.1561 |
| 0.3 | 0.9377 | 2.9 | 0.1453 |
| 0.4 | 0.8934 | 3 | 0.1325 |
| 0.5 | 0.8409 | 3.1 | 0.1175 |
| 0.6 | 0.783 | 3.2 | 0.1006 |
| 0.7 | 0.7218 | 3.3 | 0.0823 |
| 0.8 | 0.6596 | 3.4 | 0.0632 |
| 0.9 | 0.5979 | 3.5 | 0.0444 |
| 1 | 0.538 | 3.6 | 0.0268 |
| 1.1 | 0.481 | 3.7 | 0.0116 |
| 1.2 | 0.4277 | 3.8 | 0.002 |
| 1.3 | 0.3789 | 3.9 | 0.0083 |
| 1.4 | 0.3353 | 4 | 0.0111 |
| 1.5 | 0.2976 | 4.1 | 0.009 |
| 1.6 | 0.2661 | 4.2 | 0.0029 |
| 1.7 | 0.2408 | 4.3 | 0.0092 |
| 1.8 | 0.2215 | 4.4 | 0.0233 |
| 1.9 | 0.2076 | 4.5 | 0.0396 |
| 2 | 0.198 | 4.6 | 0.0568 |
| 2.1 | 0.1917 | 4.7 | 0.0737 |
| 2.2 | 0.1874 | 4.8 | 0.089 |
| 2.3 | 0.1841 | 4.9 | 0.1017 |
| 2.4 | 0.1808 | 5 | 0.1108 |
| 2.5 | 0.1768 |  |  |



UMi CDL-C Strongest beam fc = 28 GHz Reference PAS



## InO CDL-A

Table3 PDP, InO CDL-A Strongest beam fc = 28 GHz

|  |  |  |
| --- | --- | --- |
| Cluster # | Delay [ns] | X2V Power[dB] |
| 1 | 0 | -93.2547 |
| 2 | 11.457 | 0 |
| 3 | 12.075 | -5.8682 |
| 4 | 17.604 | -58.0711 |
| 5 | 13.83 | -57.1247 |
| 6 | 16.125 | -72.6082 |
| 7 | 20.124 | -5.3289 |
| 8 | 17.25 | -67.2358 |
| 9 | 22.854 | -60.2097 |
| 10 | 46.125 | -94.3956 |
| 11 | 56.934 | -60.3016 |
| 12 | 66.726 | -76.7888 |
| 13 | 65.154 | -79.5658 |
| 14 | 74.826 | -94.402 |
| 15 | 75.357 | -71.5111 |
| 16 | 91.746 | -72.6349 |
| 17 | 122.43 | -77.5789 |
| 18 | 133.737 | -95.1216 |
| 19 | 137.085 | -83.5902 |
| 20 | 143.898 | -91.193 |
| 21 | 150.198 | -85.1779 |
| 22 | 159.129 | -81.1754 |
| 23 | 289.758 | -69.816 |



Table4 Autocorrelation, InO CDL-A Strongest beam fc = 28 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Distance [λ] | X2V Corr. | Distance [λ] | X2V Corr. |
| 0 | 1 | 2.6 | 0.2003 |
| 0.1 | 0.9976 | 2.7 | 0.1841 |
| 0.2 | 0.9905 | 2.8 | 0.1712 |
| 0.3 | 0.9786 | 2.9 | 0.1614 |
| 0.4 | 0.9623 | 3 | 0.154 |
| 0.5 | 0.9417 | 3.1 | 0.1486 |
| 0.6 | 0.917 | 3.2 | 0.1443 |
| 0.7 | 0.8885 | 3.3 | 0.1408 |
| 0.8 | 0.8567 | 3.4 | 0.1374 |
| 0.9 | 0.8219 | 3.5 | 0.1339 |
| 1 | 0.7844 | 3.6 | 0.1299 |
| 1.1 | 0.7449 | 3.7 | 0.1253 |
| 1.2 | 0.7036 | 3.8 | 0.1201 |
| 1.3 | 0.6611 | 3.9 | 0.1143 |
| 1.4 | 0.6179 | 4 | 0.1082 |
| 1.5 | 0.5744 | 4.1 | 0.102 |
| 1.6 | 0.5311 | 4.2 | 0.0961 |
| 1.7 | 0.4885 | 4.3 | 0.0912 |
| 1.8 | 0.447 | 4.4 | 0.0877 |
| 1.9 | 0.4071 | 4.5 | 0.0864 |
| 2 | 0.369 | 4.6 | 0.0876 |
| 2.1 | 0.3333 | 4.7 | 0.0915 |
| 2.2 | 0.3002 | 4.8 | 0.0976 |
| 2.3 | 0.2702 | 4.9 | 0.1056 |
| 2.4 | 0.2434 | 5 | 0.1147 |
| 2.5 | 0.22 |  |  |



InO CDL-A Strongest beam fc = 28 GHz Reference PAS



# 3 Conclusions

Proposal 1. Accept the PDP, TC, and PAS theoretical targets in this contribution as FR2 channel model validation reference curves for Umi CDL-C and InO CDL-A channel models.

# 4 References

[1] TS 38.151 “Multiple Input Multiple Output (MIMO) Over-the-Air (OTA) performance requirements for NR UEs”, V17.0.0