Item 1a:

1. Scenarios:
   1. HST: SS, Z, I, MoM/L
   2. Rural/highways: SS, Z, I
   3. Dense urban: Z, I, MoM/L, DCM
   4. Indoor hotspot: Z, MoM/L
2. Speed:
   1. 30 kmph: H, CMCC, Sony
   2. 60 kmph: Z, H, CMCC, O, Sony, N
   3. 120 kmph: Z, CMCC, N
   4. 500 kmph: SS, CMCC
3. Starting point: 38.901, 38.913, 38.802
4. UE physical mobility/trajectory modeling: Z, I, CATT, E, MoM/L, N, MTK
   1. Handling of UEs crossing cell boundaries: E
5. Blockage modeling (38.901): Z, H, L, MoM/L, FWei, V, N
   1. Spatial consistency: Z, I, MTK
6. UE rotation: H, L, MoM/L, V
7. Metric:
   1. KPIs for low overhead/latency beam tracking/indication: I
   2. trade-off between latency/overhead versus UPT: H
   3. Outage: SS, Z, L
   4. beam switching latency and BFR rate: FWei
   5. HO latency: O
   6. Beam metric (RSRP or SINR): Sony
   7. KPI for high speed: Sony
8. Intra-/inter-cell mobility (including HO modeling): I, CATT, MoM/L, O, N
9. Tx/Rx beam selection method: E, Sony
10. RS transmission scheme: E

Item 1b:

1. Number of panels
   1. 2 panels: MoM/L, Sony, DCM
   2. 3 panels (left, right, back), each panel is 1x4x2: SS, N, MTK
   3. 4 panels (left, right, top, bottom), each panel is 1x4x2: E, Sony, MTK
   4. 4 panels + different panel size and #beams: H
2. Beam direction (orientation) per panel: SS
3. for MTRP scenario: I, MoM/L, MTK
4. MPE mitigation is baseline: I
5. MPE
   1. Panel blocking model, EIPR: SS, CATT, E, V, O, N, MTK, Q
   2. RAN4 sol is baseline: H, E, Sony, N, MTK
   3. Random modeling: H
   4. model random drop of UE Tx power: N
   5. UE power consumption, backoff model (including max UL power): O, Q, N
6. Single panel based DL and UL: H
7. Panel selection/activation/switching time: H, CATT, V
   1. Autonomous panel selection/switching is baseline: H
8. Per panel configuration: MTK

Common (1a+1b) + others:

1. Details of TXRU mapping to antenna elements & antenna configurations: Z, MoM/L
2. Cell association scheme: A
3. Panel calibration error: L
4. new/augmented assumptions and performance metrics, calibration and benchmarking may be need: FWei
5. How to evaluate Uniform TCI I: E, CMCC

LLS (in addition to SLS):

1. Z, I, L, MoM/L
2. SLS for mobility, LLS for non-mobility: CATT
3. LLS for evaluating beam indication and switching delay: V

**Proposal:**

For SLS simulations the simulation assumptions are given by the following table. Items that are the same as what has been agreed in R16 are in green.

|  |  |  |
| --- | --- | --- |
| **Parameters** | **Values** | **Company comments** |
| Frequency Range | FR2 @ 30 GHz,   * SCS: 120 kHz * BW: 80 MHz |  |
| Scenarios | Dense urban (TR 38.901/38.913)  Optional: Indoor hotspot (TR 38.901/38.913)  High speed:   * Highway (Urban Macro, TR 38.901/37.885) * High speed train (TR 38.802/38.913) |  |
| UE Speed | 30 km/hr  High speed:   * 120 km/hr * 500 km/hr (for HST only) |  |
| Transmission Power | Maximum Power and Maximum EIRP for base station and UE as given by corresponding scenario in 38.802 (Table A.2.1-1 and Table A.2.1-2) |  |
| BS Antenna Configuration | (M, N, P, Mg, Ng) = (4, 8, 2, 2, 2). (dV, dH) = (0.5, 0.5) λ. (dg,V, dg,H) = (2.0, 4.0) λ  Companies to explain TXRU weights mapping.  Companies to explain beam selection.  Companies to explain number of BS beams |  |
| BS Antenna radiation pattern | TR 38.802 Table A.2.1-6, Table A.2.1-7 |  |
| UE Antenna Configuration | **Number/location of Panels**   * 3 Panel UEs (left, right and back) (baseline) * 4 Panel UEs (optional)   **Panel structure**   * 1x4x2 (Baseline) * Other panel structures optional (company to report)   Companies to explain TXRU weights mapping.  Companies to explain beam and panel selection.  Companies to explain number of UE beams |  |
| UE Antenna radiation pattern | TR 38.802 Table A.2.1-8, Table A.2.1-10 |  |
| Beam correspondence | Companies to explain beam correspondence assumptions. |  |
| Link adaptation | Based on CSI-RS |  |
| Traffic Model | FTP model 1 with packet size 0.5Mbytes (other value is not precluded).  Other traffic models including the full buffer are not precluded. |  |
| Panel Blockage Modeling | Companies to provide details on blocking model. For example:   * Details on number of blocked panels * Details of random modeling. * Details on pathloss of blocked panel |  |
| MPE Modeling | Companies to provide on details on MPE modeling. For example   * Maximum power (EPIR) per beam direction/panel * etc. |  |
| UE Mobility, trajectory handling and UE rotation | Consider mobility with linear trajectories;  Companies to provide details on add-on features including UE mobility, rotation, blockage, spatial consistency etc. |  |
| Inter-panel calibration for UE | Ideal, non-ideal following 38.802 (optional) – Explain any errors |  |
| Control and RS overhead | Companies report details of the assumptions |  |
| Control channel decoding | Ideal or Non-ideal (Companies explain how it is modelled) |  |
| UE receiver type | MMSE-IRC as the baseline, other advanced receiver is not precluded |  |
| BF scheme | Companies explain what scheme is used |  |
| Transmission scheme | Multi-antenna port transmission schemes  Note: Companies explain details of the using transmission scheme. |  |
| Other simulation assumptions | Companies to explain: panel switching latency  Companies to explain cell association scheme, and serving TRP selection  Companies to explain scheduling algorithm |  |
| Algorithm details | Companies to report:   * Beam reporting mechanism * Beam metric L1-RSRP; L1-SINR is optional * Number of active panels |  |
| Performance metrics | * Outage * CDF of UPT, avg. and 5% UPT * Overhead * Latency of beam switching * Latency of Handover |  |

**Proposal:**

LLS simulations for beam management are optional. For LLS simulations reuse the R16 LLS simulation assumptions for beam management. The agreed R16 LLS simulation assumptions are listed in the following Tables. The entries in red are not agreed in R16.

|  |  |
| --- | --- |
| Parameters | Values |
| Carrier Frequency | 30 GHz |
| Subcarrier Spacing for data | For 30 GHz: 120kHz |
| Data allocation | 8 RBs (baseline), Larger # of PRB (e.g. 32) can be considered.  First 2 OFDM symbols for PDCCH, and following 12 OFDM symbols for data channel |
| Channel Model | CDL-A model  -               delay spread =30ns  -               UE speed=3km/h. (baseline) 30, 60km/h (optional)  -               The angles of BS, i.e., AoD, ZoD, are uniformly distributed within [-60, 60] degrees in azimuth domain and [90, 135] degrees in zenith domain, and those of UE, i.e., AoA, ZoA, are uniformly distributed within [-180, 180] degrees in azimuth domain and [45, 90] in zenith domain, via applying uniform-distribution desired mean angle in subclause 7.7.5.1 in TR 38.901 accordingly. |
| TXRU mapping to antenna elements | Companies explain details of the using TXRU mapping to antenna elements.  Notes:  2D DFT based beam per polarization as a baseline; |
| TXRU mapping weights | Companies to provide details on TXRU mapping weights. |
| Procedure of beam sweeping | Companies to provide details on procedure of beam sweeping. |
| Criteria for beam selection | Companies to provide details on criteria for beam selection. |
| UE reporting | Companies to provide details on criteria for UE reporting. |
| BS antenna configurations | For 30 GHz: (M, N, P, Mg, Ng) = (4, 8, 2, 2, 2). (dV, dH) = (0.5, 0.5)λ. (dg,V, dg,H) = (2.0, 4.0)λ  or (M, N, P, Mg, Ng) = (4, 8, 2, 1, 1). (dV, dH) = (0.5, 0.5)λ. (dg,V, dg,H) = (2.0, 4.0)λ  Other Antenna configuration is not precluded. |
| BS antenna element radiation pattern | For 30 GHz: According to TR38.802 |
| UE antenna configurations | For 30 GHz: (M, N, P, Mg, Ng) = (2, 4, 2, 1, 2) or (M, N, P, Mg, Ng) = (2, 4, 2, 1, 1)  (dV, dH) = (0.5, 0.5)λ. (dg,V, dg,H) = (0, 0)λ. \* Θmg,ng=90°; Ω0,1=Ω0,0+180°;  Other Antenna configuration is not precluded. |
| BS array orientation | azimuth 0 degree; mechanic downtilt: 0 degree |
| UE array orientation | ΩUT,a uniformly distributed on [0, 360] degree, ΩUT,b = 0°, ΩUT,g = 0° (baseline) |
| UE antenna element radiation pattern | See Table A.2.1-8 in TR 38.802 |
| Transmission scheme | Multi-antenna port transmission schemes  Note: Companies explain details of the using transmission scheme. |
| MIMO mode | SU-MIMO |
| UE receiver type | MMSE-IRC as baseline; other advanced receiver is not precluded. |
| Link adaptation | Based on CSI-RS |