**3GPP TSG RAN meeting #104 RP-24xxxx**

**Shanghai, China, June 17-20, 2024**

## Status Report to TSG

**Agenda item:** 9.2.4

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| --- | --- |
| **WI / SI Name** | Study on AI (Artificial Intelligence)/ML (Machine Learning) for mobility in NR |
| included in this status report | Study Item: Yes | Core part: No | Performance part:No | Testing part:No |
| **Acronym** | FS\_NR\_AIML\_Mob |
| **Unique ID** | 1020084 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-240082 |
| **Target Completion Date****(indicate if changed)** | Study Item: 09/2025 | Core part: N/A | Performance part: N/A | Testing part: N/A |
| **Overall Completion level** | Study Item: 25 % | Core part: N/A | Performance Part: N/A | Testing part: N/A |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

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| --- | --- |
| **Leading WG** | RAN WG2 |
| **Rapporteur** | **Name** | Zhongda Du |
| **Company** | OPPO |
| **Email** | duzhongda@oppo.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

#### 2.1.2 Remaining Open issues

## 2.2 RAN2

#### 2.2.1 Agreements

RAN2#125bis agreements:

**Agreements:**

1. At least measurement event evaluation based on RRM measurement prediction result will be studied. Direct measurement event prediction are is also allowed.
2. Clarifications on what is being as input should be provided with results
3. Start with A3 as a baseline.
4. Measurement event prediction study can start after some further progress on RRM measurement prediction has been made

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| --- |
| Agreements to start evaluations * FR1-to-FR1
	+ Focus on intra-frequncy in time domain prediction for the purpose of measurement reduction
	+ Study inter-frequency scenario in terms of which scenarios can be studied without requiring new channel model and also resolving any simulation assumptions (if possible).
* FR2-to-FR2
	+ Focus on ~~Case 1~~ intra-frequency
	+ Perform evaluation both in time and spatial domain
 |

**Agreements**

1. AI mobility SI uses synthesized datasets based on 3GPP agreed channel model and deployment for evaluation. Field data is optional
2. Reuse current RAN1’s simulation assumptions as much as possible by extending data generation to neighbouring cells.
3. Once a set of simulation parameters and assumptions per each sub-use case (e.g., propagation scenario, deployment topology, channel modelling, UE trajectories, etc.) are settled, it should be used for baseline case (i.e. without AI/ML model), training (e.g. data set generation), validation, and inference etc.
4. Clarify and document the use of random seeds in between the training and test dataset, simulation drops/runs at least for channel modelling and UE trajectory.
5. Alignment of simulation assumptions is necessary, but explicit result calibration (e.g., as in TR 36.839) is not expected. Companies can independently report their gains achieved by AI/ML with detailed evaluation descriptions for cross-checking purposes.

6 For FR1, band n77/n78 is considered with 4GHz as the central frequency. FFS any other band

7 For FR2, only FR2-1 is considered, e.g., band n257. 30GHz central frequency can be adopted to reuse RAN1’s work as much as possible. FFS any other band

8 focus on Urban Macro (UMa) for FR1 and Umi for FR2

9 RAN2 takes hexagonal regular topology as the starting point.

10 Take baseline simulation assumptions from Table 6.3.1-1 in TR 38.843 for FR2 as the starting point for channel modelling, e.g., BS/UE antenna configuration, BS Tx power, and BS/UE antenna height. UE rotation is excluded in the initial phase of evaluation.

11 UE trajectory model uses options 1-3 in TR 38.843 section 6.3.1 as the starting point. Down-selection to be discussed in email discussion

12 AI/ML model generalization could be addressed after sufficient performance gains for different use cases are found.

RAN2#126 agreements:

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| **Agreements on simulation assumptions**1 For 2nd study goal i.e. to enhance handover performance, evaluation exercise will focus on FR2 to FR2 intra-frequency scenario.2 For the evaluation exercise for 2nd study goal, RAN2 should assume that there is no reduction in measurement overhead3 Prediction accuracy metric for RRM measurement cell level prediction is defined as “RSRP difference between predicted L3 cell level measurement result and actual L3 cell level measurement result of the same cell” for all RRM sub cases4 for RRM sub case 1, it is up to company to report L1 RSRP difference*5* Definition of measurement reduction for intra-frequency scenario is defined as:(20/20) Measurement reduction rate in temporal domain (MRRT) assuming same length of measurement time instances:MRRT= skipped measurement time instances / total measurement time instancesMeasurement reduction rate in spatial domain (MRRS):MRRS = skipped beams to be measured/ total beams to be measured6 For RRM sub case 1 and 3, it is up to company’s implementation whether L1 filtering is applied for input L1 beam level measurement. Companies are expected to report what L1 filtering they use in their simulation. 7 To agree on methodology of Intra\_F\_C\_T\_Case A as following:  Intra-frequency intra-cell temporal domain case A prediction is done by predicting measurement result(s) in prediction window based on measurement results in observation window of the same cell for both FR1\_to\_FR1 and FR2\_to\_FR2. FFS aligning the prediction window 8 To agree on methodology of Intra\_F\_C\_T\_Case B: Intra-frequency intra-cell temporal domain prediction is done by predicting sub set measurement (case B) instances in temporal domain of the same cell for both FR1\_to\_FR1 and FR2\_to\_FR2. Several measurement reduction rates should be aligned among companies. The detail values for measurement reduction rate are FFS.9 Intra-frequency intra-cell temporal domain prediction can be applied for all RRM sub cases. And it is up to company to report applied RRM sub case together with simulation result.10 Methodology of Intra\_F\_C\_S: Intra-frequency intra-cell spatial domain prediction is done by measuring sub set of configured SSB as input to the model to predict L3 cell level measurements for every instance of the same cell. It is only evaluted for FR2 intra-frequency scenario and RRM sub case 1 and 3. Several measurement reduction rates should be aligned among company without defining detail pattern. The detail rate values are FFS. 11 For both Intra-frequency and inter-frequency inter-cell prediction, the measurement on cell for measurement should not be reduced in both temporal and spatial domain 12 For Inter\_F\_C (inter-frequency inter-cell), RAN2 start evaluation from co-located scenario13 for Inter\_F\_C(inter-frequency inter-cell), RAN2 should focus on the case where cell for measurement and cell for prediction are in the same sector.14 FR1 to FR1 inter-frequency inter-cell prediction is applicable for all RRM sub cases. And it is up to company to report applied RRM sub cases together with their simulation result. 16 Intra\_F\_Inter\_C (intra-frequency inter-cell) prediction will not be evaluated at least in early stage. Intra\_F\_Inter\_C(Intra-frequency inter-cell) refers to both co-located and non-colocated neighbouring cell prediction. 17 No traffic model is simulated18 During simulation UE is dropped 100% outdoor 19 It is up to company’s implementation to select how to distribute the UE20 Fast fading is necessary for RRM sub case 1 and 3. FFS case 221 To agree not consider Oxygen absorption (7.6.1), Time-varying Doppler shift (7.6.6), Explicit ground reflection model (7.6.8) and blockage (7.6.4) for channel modelling (38.901)22 LOSsoft is optionally modelled in the channel modelling23 To agree on following parameters for FR2:1, 30GHz as central frequency2, 200m as ISD3, UMi with distance-dependent LoS probability function defined in Table 7.4.2-1 in TR 38.901 as baseline channel modelling24 For FR1, following parameters are agreed:1, Table 6.2.1-1 template is taken as starting point ( to be updated by individual proposal later on) 3, to set up 2-tier model (7 sites, 3 sectors/cells per site) (20/20)4, 500m as ISD 5, channel modelling is UMa with distance-dependent LoS probability function defined in Table 7.4.2-1 in TR 38.9016, 20MHz as bandwidth 7, The recommendated value in yellow in table 2.3.3-1 ( by removing wording “At least for BM-Case1,”) 25 Section 7.6.5 in 38.901 is taken as baseline for inter-frequency correlation model. Whether inter-frequency correlation model is used is optional and companies can report what they use. FFS on the understanding shadowing correlation in inter-freq. For now companies should report what assumption they have made26 Following RRC parameters need be aligned as simulation parameters: (17/20)- RRC parameters for measurement consolidation- RRC parameters for L3 filtering (filter coefficient, measurement period)27 We apply same L1 sampling period for both intra and inter (i.e. we don’t simulate existence of measurement gap as starting point)28 Simulation assumptions discussed in section 2.3.1~2.3.3 is taken as baseline also for use cases other than RRM measurement prediction. Any update is subject to further discussion on other use cases. 29 The sample period(s) are aligned among companies for intra-frequency intra-cell temporal domain prediction. We can start with 20ms for FR2 and 40ms for FR1.  Measurement period: FFS – suggestion from rapporteur is to start with 480ms for FR2 and 200ms for FR1 30 Simulation parameters in table 2.3.4-1 (by removing Table A.2.1-7 and Table 2.1-10) are taken as starting point for both UE sided model and network sided model for FR2. The number of beams could be left for company to report. FFS Use 100Mhz for channel BW?31 For FR1, following parameters are agreed:2, {4GHz,30KHz} as frequency for intra-frequency scenario and {2GHz, 15KHz(FDD)/30GHz(TDD)} as another frequency for inter-frequency scenario  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Agreements**1 average RSRP difference is taken as prediction accuracy metric for RRM measurement prediction. Note the RSRP difference values should be an absolute value before they are averaged2: Measurement reduction rates e.g. 1/2, for both intra-frequency intra-cell temporal domain prediction case B and spatial domain prediction. Revision in RAN2#127 is open.3: One prediction window for FR1 and FR2 respectively as starting point. The detail value to be decided in the post email discussion.4: UE trajectory option is up to company’s implementation and report5: UE trajectory boundary processing is up to company’s implementation and report6: For study goal 2, the candidate speeds are 60,90,120 km/h and company can report UE speed along with simulation result7: For study goal 1, the candidate speeds are 30,60,90km/h and company can report UE speed along with simulation result8: To decide on the values in table 2.4-2/3/4 in post email discussion.

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| --- | --- |
| L3 filtering parameter for both FR1 and FR2 | Recommended value |
| FilterCoefficient | 4 |

Table 2.4-2

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| --- | --- |
| Measurement period | Recommended value |
| FR1 to FR1 intra-frequency w.o. gap | 200ms  |
| FR1 to FR1 inter-frequency with gap | 120ms |
| FR2 to FR2 intra-frequency w.o. gap | 480ms  |

Table 2.4-3

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| --- | --- |
| Consolidation parameter | Recommended value |
| nrofSS-BlocksToAverage for FR1 | 1 |
| nrofSS-BlocksToAverage for FR2 | 3 |
| absThreshSS-BlocksConsolidation | FFS |

Table 2.4-49: To agree on 80MHz as bandwidth for FR210: To agree on 10m for BS antenna height for FR211: Fast fading is necessary for RRM sub case 2 too.12: The shadowing fading of two different frequency layers can be reported by company13: To define cluster approach at least based on the number of input cells, number of output cells and their relationship in temporal domain, spatial domain and frequency domain |

**Agreements:**

**The following is agreed**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Case number | Prioritization  | Evaluation scenario combination | target study goal | Methodology |
| 1 | Low | FR1 to FR1 intra-frequency temporal domain case A | 2nd goal | TBD |
| 2 | High | FR1 to FR1 intra-frequency temporal domain case B | 1st goal | Intra-cell |
| 3 | High | FR1 to FR1 inter-frequency (frequency domain) | 1st goal | Inter-cell  |
| 4 | High | FR2 to FR2 intra-frequency temporal domain case A | 2nd goal | Intra-cell |
| 5 | Low | FR2 to FR2 intra-frequency temporal domain case B | 1st goal | TBD |
| 6 | Middle | FR2 to FR2 intra-frequency spatial domain | 1st goal | Intra-cell |

=> We will start the evaluation with measurements prediction accuracy and model complexity. We can discuss system performance after we see which scenarios have good measurements prediction accuracy.

**Agreements**

1. For the cell level measurement prediction, start with consider a fixed value for L3 filtering in simulation. FFS which fixed value
2. For cell level prediction, RSRP difference to the actual measurement is calculated based on L3 filtered measurement result

**Agreements**

1 Study Indirect: RLF prediction based on the temporal domain serving cell measurement predictions (e.g. SINR).

2 Study Direct: Directly RLF prediction by AI/ML models.

3 FR2 study will be prioritized for RLF prediction

4 The study should focus on RLF due to T310 expiry (i.e. in-synch/out-of-synch case) as the representative RLF case for direct and indirect prediction.

5 HOF prediction is down prioritized in our study. NO simulations/evaluations should be done/submitted

6 RLF prediction result is the RLF probability within a time window or at time instance, at least for direct case. FFS on expected RLF time and indirect case.

7 No evaluation/simulations are expected for August meeting for RLF

8 Simulation assumption specific to RLF will be discussed in August. The assumption is that we will reuse RRM simulation assumptions (where possible).

Summarized simulation assumptions based on RAN2’s agreements so far:

|  |  |  |
| --- | --- | --- |
| Parameter | Value for FR1 | Value for FR2 |
| Frequency Range | FR1@{4GHz,30KHz} as central frequency for intra-frequency scenarioFR1@{2GHz, 15/30KHz} as another frequency for inter-frequency scenario | FR2 @ 30 GHz; SCS: 120 kHz |
| Deployment | 2-tier model with wrap-around (7 sites, 3 sectors/cells per site) | 2-tier model with wrap-around (7 sites, 3 sectors/cells per site) |
| Channel model | UMa With distance-dependent LoS probability function defined in Table 7.4.2-1 in TR 38.901, fast fading and optional LOSsoft;without Oxygen absorption, Time-varying Doppler shift, Explicit ground reflection model and blockage. | UmiWith distance-dependent LoS probability function defined in Table 7.4.2-1 in TR 38.901, fast fading and optional LOSsoft;without Oxygen absorption, Time-varying Doppler shift, Explicit ground reflection model and blockage |
| System BW | 20MHz | 80MHz |
| UE speed | 30,60,90 km/h for study targeting measurement reduction60,90,120 km/h for study targeting HO performance improvement | 30,60,90 km/h for study targeting measurement reduction60,90,120 km/h for study targeting HO performance improvement |
| UE distribution | 100% outdoor | 100% outdoor |
| BS Antenna Configuration | Companies need to report which option(s) are used between- 32 ports: (8,8,2,1,1,2,8), (dH,dV) = (0.5, 0.8)λ- 16 ports: (8,4,2,1,1,2,4), (dH,dV) = (0.5, 0.8)λOther configurations are not precluded. | Antenna setup and port layouts at gNB: (4, 8, 2, 1, 1, 1, 1), (dV, dH) = (0.5, 0.5) λOther assumptions are not precluded. |
| BS Antenna radiation pattern | 3-sector antenna radiation pattern, 8 dBi | TR 38.802 Table A.2.1-6, |
| UE Antenna Configuration | 4RX: (1,2,2,1,1,1,2), (dH,dV) = (0.5, 0.5)λ for (rank 1-4)2RX: (1,1,2,1,1,1,1), (dH,dV) = (0.5, 0.5)λ for (rank 1,2)Other configuration is not precluded. | Antenna setup and port layouts at UE: (1, 4, 2, 1, 2, 1, 1), 2 panels (left, right)Other assumptions are not precluded |
| UE Antenna radiation pattern | Omni-direction | TR 38.802 Table A.2.1-8,  |
| BS Tx Power | 44dBm  | 40 dBm (baseline)Other values (e.g., 34 dBm) not precluded |
| Maximum UE Tx Power | 23dbm | 23 dBm |
| BS receiver Noise Figure | 5db | 7 dB |
| UE receiver Noise Figure | 9dB | 10 dB |
| Inter site distance | 500m | 200 m |
| BS Antenna height | 25m | 10m |
| UE Antenna height | 1.5m | 1.5 m |
| Spatial consistency | companies report one of the spatial consistency procedures: - Procedure A in TR38.901- Procedure B in TR38.901 | companies report one of the spatial consistency procedures: - Procedure A in TR38.901- Procedure B in TR38.901 |
| UE trajectory model | 3 options in 38.843 section 6.3.1 | 3 options in 38.843 section 6.3.1 |
| UE trajectory boundary processing model | Companies report which of the following models they used:wrap round model, circle-bouncing model,boundary-terminated model | Companies report which of the following models they used:wrap round model, circle-bouncing model,boundary-terminated model |

Table 2.2.1-1 Simulation assumptions

#### 2.2.2 Remaining Open issues

For RRM measurement use case:

1, Evaluation based on simulation result

For Measurement event use case:

 1, Further clarification on the use case including definition, metrics

 2, Measurement event specific Simulation assumptions, simulation methodology

For RLF use case:

 1, Further clarification on the use case e.g. metrics

 2, RLF specific Simulation assumptions, simulation methodology

HOF prediction is down prioritized

Issues covered by following objectives in the SID:

* Potential AI mobility specific enhancement should be based on the Rel19 AI/ML-air interface WID general framework (e.g. LCM, performance monitoring etc) [RAN2]
	+ NOTE: This would only be treated after sufficient progress is made in the Rel-19 AI/ML air interface WID
* Potential specification impacts of AI/ML aided mobility [RAN2]
* Evaluate testability, interoperability, and impacts on RRM requirements and performance [RAN4]

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

#### 2.4.2 Remaining Open issues

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

Contributions submitted to RAN2#125bis meeting:

R2-2402748 Discussion on RRM measurement prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402552 Initial consideration on RRM measurement prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402403 Areas of interest for RRM measurement prediction Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403497 Consideration on AI/ML based RRM measurement prediction Xiaomi discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402559 Discussion on RRM measurement prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402168 Discussion on RRM measurement prediction OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402250 AI/ML RRM measurement prediction TCL discussion Rel-19

R2-2402275 Discussion on RRM measurement predicton Fujitsu discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402285 Evaluation on Measurement Gap Reduction with AI Prediction MediaTek Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402296 Evaluation on AI/ML in Spatial/Temporal Prediction for RRM Measurement MediaTek Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402303 Consideration on RRM measurement prediction CATT discussion Rel-19 FS\_NR\_AIML\_Mob Revised

R2-2402315 Artificial Intelligence/Machine Learning for mobility in NR BJTU discussion

R2-2402343 Discussion on RRM measurement prediction Spreadtrum Communications discussion Rel-19

R2-2402403 Areas of interest for RRM measurement prediction Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402410 RRM measurement prediction Qualcomm Incorporated discussion Rel-19

R2-2402516 Discussion on AI/ML based RRM measurement prediction in NR China Telecom discussion Rel-19

R2-2402552 Initial consideration on RRM measurement prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402559 Discussion on RRM measurement prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402589 Discussion on RRM measurement prediction Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402595 Discussion on AI based RRM measurement prediction NEC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402687 Discussion on AI aided RRM measurement prediction HONOR discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402733 Consideration on types of RRM measurement prediction Lenovo discussion Rel-19

R2-2402748 Discussion on RRM measurement prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403109 Discussion on RRM measurement prediction Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403124 RRM measurement prediction Fraunhofer HHI, Fraunhofer IIS discussion

R2-2403254 AI/ML based RRM measurement predictions Ericsson discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403281 On the measurement prediction use-case Nokia discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403418 Potential scenarios for RRM measurement prediction Kyocera discussion Rel-19

R2-2403497 Consideration on AI/ML based RRM measurement prediction Xiaomi discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403554 RRM measurement prediction Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403622 Cell-level measurement prediction LG Electronics Inc. discussion FS\_NR\_AIML\_Mob

R2-2403670 Consideration on RRM measurement prediction CATT, Turkcell discussion Rel-19 FS\_NR\_AIML\_Mob R2-2402303

R2-2402560 Discussion on Measurement event prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403555 Measurement event prediction Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403023 Discussion on measurement event prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402590 Discussion on measurement event prediction Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402169 Discussion on measurement event prediction OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402297 Evaluation on AI/ML for Measurement Event Prediction MediaTek Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402169 Discussion on measurement event prediction OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402174 Discussion on unintended event prediction OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402253 Discussion on measurement event prediction TCL discussion Rel-19

R2-2402297 Evaluation on AI/ML for Measurement Event Prediction MediaTek Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402304 Consideration on measurement event prediction CATT discussion Rel-19 FS\_NR\_AIML\_Mob Revised

R2-2402317 Measurement event prediction Xiaomi discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402404 Areas of interest for measurement event prediction Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402411 Measurement event predictions Qualcomm Incorporated discussion Rel-19

R2-2402560 Discussion on Measurement event prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402590 Discussion on measurement event prediction Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402683 Discussion on measurement event predictions III discussion FS\_NR\_AIML\_Mob

R2-2402688 Discussion on AI aided measurement event prediction HONOR discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402749 Discussion on measurement event prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402898 On measurement event prediction Apple discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403023 Discussion on measurement event prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403056 Data collection for event prediction Sony discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403110 Discussion on measurement event prediction Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403214 Target scenarios for measurement event prediction NEC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403255 AI/ML based measurement events prediction Ericsson discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403282 Considerations on the measurement event prediction use-case Nokia discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403419 Potential scenarios for measurement event prediction Kyocera discussion Rel-19

R2-2403555 Measurement event prediction Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403623 Measurement event prediction LG Electronics Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403671 Consideration on measurement event prediction CATT, Turkcell discussion Rel-19 FS\_NR\_AIML\_Mob R2-2402304

R2-2402750 Discussion on RLF and HO failure prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402999 Discussion on RLF/HOF prediction Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402432 Discussion on RLF/HO failure prediction Xiaomi discussion

R2-2402561 Discussion on RLF/HO failure prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403624 HOF and RLF prediction LG Electronics Inc. discussion FS\_NR\_AIML\_Mob

R2-2402895 On RLF and HO failure prediction Apple discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402166 Discussion on study on AI/ML for Mobility Continental Automotive discussion Rel-19

R2-2402248 AI/ML HO failure prediction TCL discussion Rel-19

R2-2402249 AI/ML RLF prediction TCL discussion Rel-19

R2-2402305 Consideration on HO Failure and RLF Prediction CATT discussion Rel-19 FS\_NR\_AIML\_Mob Revised

R2-2402405 Areas of interest for RLF/HO failure prediction Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402412 RLF/HO failure prediction Qualcomm Incorporated discussion Rel-19

R2-2402432 Discussion on RLF/HO failure prediction Xiaomi discussion

R2-2402561 Discussion on RLF/HO failure prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402689 Discussion on HO failure/RLF prediction HONOR discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402722 Prediction for HO failure and RLF Lenovo discussion Rel-19

R2-2402750 Discussion on RLF and HO failure prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402895 On RLF and HO failure prediction Apple discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402999 Discussion on RLF/HOF prediction Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403024 Discussion on HOF and RLF prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403111 Discussion on HOF and RLF prediction Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403215 Target scenarios for failure prediction NEC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403244 Discussion on AI/ML based RLF and HOF predictions Ericsson discussion FS\_NR\_AIML\_Mob

R2-2403420 Potential scenarios for RLF/HOF prediction Kyocera discussion Rel-19

R2-2403452 Discussion on HO failure/RLF prediction Nokia discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403556 RLF/HOF prediction Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403624 HOF and RLF prediction LG Electronics Inc. discussion FS\_NR\_AIML\_Mob

R2-2403672 Consideration on HO Failure and RLF Prediction CATT, Turkcell discussion Rel-19 FS\_NR\_AIML\_Mob R2-2402305

R2-2403958 Way forward on evaluation scenarios for AI mobility NR OPPO, MediaTek, Samsung, CMCC,Nokia,CAICT,CATT,Xiaomi, China telecom, vivo

R2-2403713 Discussion on simulation assumptions of AI mobility OPPO,Nokia,MediaTek,CMCC, Interdigital

R2-2403245 Simulation based evaluation of the AIML added mobility Ericsson discussion FS\_NR\_AIML\_Mob

R2-2402445 Simulation Environments for AI/ML-assisted Mobility Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403112 Discussion on simulation assumptions Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403713 Discussion on simulation assumptions of AI mobility OPPO,Nokia,MediaTek,CMCC, Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402287 Discussion on Evaluation Methodology for AI Mobility MediaTek Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402306 Simulation and evaluation for AIML for mobility in NR CATT discussion Rel-19 FS\_NR\_AIML\_Mob Revised

R2-2402406 Simulation Assumption for AI/ML Mobility Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402413 Simulation assumption and evaluation methodology Qualcomm Incorporated discussion Rel-19

R2-2402433 Discussion on simulation assumption and evaluvation methodology Xiaomi discussion

R2-2402445 Simulation Environments for AI/ML-assisted Mobility Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402553 Discussion on common Evaluation Methodology and Simulation Assumption CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402562 Discussion on Simulation assumption and evaluation methodology vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402673 Simulation assumption and evaluation methodology NEC discussion

R2-2402751 Discussion on simulation assumption and evaulation methodology for AI mobility ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2402897 On KPIs for evaluation and training datasets Apple discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403112 Discussion on simulation assumptions Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403245 Simulation based evaluation of the AIML added mobility Ericsson discussion FS\_NR\_AIML\_Mob

R2-2403487 Discussion on simulation assumptions of AI for mobility Nokia, Nokia Shanghai Bell discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403498 Discussion n the simulation assumption and evaluation methodology of AI/ML for mobility NTT DOCOMO, INC. discussion Rel-19

R2-2403514 Discussions on simulation assumption and evaluation methodology KDDI Corporation discussion Rel-19

R2-2403557 Simulation assumption and evaluation methodology Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2403568 Discussion on simulation assumption of AI for mobility China Unicom discussion FS\_NR\_AIML\_Mob

R2-2403673 Simulation and evaluation for AIML for mobility in NR CATT, Turkcell discussion Rel-19 FS\_NR\_AIML\_Mob R2-2402306

Contributions submitted to RAN2#126 meeting:

R2-2404711 Discussion on work plan of AI mobility SI OPPO,Nokia,Mediatek discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405693 TR 38.744 Skeleton of AI mobility NR OPPO draft TR Rel-19 38.744 0.0.1 FS\_NR\_AIML\_Mob

R2-2404338 RRM Measurement Prediction for Enhanced Handover Lekha Wireless Solutions discussion Rel-19 Late

R2-2404630 On measurement prediction Apple discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405551 Discussion on framework for RRM measurement CEWiT discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404270 Additional consideration for RRM prediction simulation assumption Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404307 Discussion on system-level performance KPI for RRM measurement prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404474 Discussion on Evaluation Methodology of RRM Prediction MediaTek Inc. discussion

R2-2404485 Simulation based evaluation of AIML aided mobility Ericsson discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404601 Discussion on simulation and evaluation methodology Xiaomi discussion

R2-2404713 Discussion on simulation assumptions of RRM measurement OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404955 Summary of [POST125bis][021][AIML mobility ] Simulation assumptions and methodology OPPO discussion Rel-19 FS\_NR\_AIML\_Mob Late

R2-2405005 Discussion on the simulation assumptions and evaluation methodology for RRM measurement prediction NTT DOCOMO, INC. discussion Rel-19

R2-2405064 Discussion on simulation assumption for RRM measurement prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405205 Considerations for mobile UE trajectory generation and channel modelling for simulation evaluation Qualcomm Incorporated discussion Rel-19

R2-2405206 Simulation assumptions and evaluation methodology for RRM measurement prediction Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405444 Further discussion on simulation assumptions and methodology for RRM measurement prediction Nokia, Nokia Shanghai Bell discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405592 Considerations on Simulation for AI/ML Mobility Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405653 Remaining aspects of simulation assumptions for RRM measurement prediction Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404260 Other aspects related to RRM measurement prediction Fraunhofer HHI, Fraunhofer IIS discussion

R2-2404283 Discussion on AI/ML based RRM measurement prediction China Telecom Corporation Ltd. discussion Rel-19

R2-2404308 Other aspects related to RRM measurement prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404313 AIML Mob RRM measurement prediction NEC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404368 AI/ML RRM measurement prediction TCL discussion Rel-19

R2-2404472 Evaluation and Preliminary Results on AIML for RRM Measurement Prediction MediaTek Inc. discussion

R2-2404475 Discussion on Other Aspects related to RRM Prediction MediaTek Inc. discussion

R2-2404558 Discussion on AI aided RRM measurement prediction HONOR discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404609 Consideration on AI/ML based RRM measurement prediction Xiaomi discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404629 On evaluation methodology Apple discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404695 Consideration on inter-frequency RRM Measurement Prediction CATT, Turkcell discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404700 Discussion on RRM measurement prediction Samsung discussion Rel-19 FS\_NR\_AIML\_Mob Late

R2-2404715 Discussion on open issue of RRM measurement use case OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404824 Further Discussion on Other Aspects related to RRM Measurement Prediction Continental Automotive discussion Rel-19

R2-2404936 Discussion on other aspects related to RRM measurement prediction Spreadtrum Communications discussion Rel-19

R2-2404999 Discussion on other aspects related to RRM measurement prediction NTT DOCOMO, INC. discussion Rel-19

R2-2405028 Discussion on AIML based RRM measurement prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405065 Discussion on RRM measurement prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405095 On AI based RRM measurement predictions Ericsson discussion FS\_NR\_AIML\_Mob

R2-2405161 RRM measurement prediction scenarios and sub-use cases Nokia discussion Rel-19 FS\_NR\_AIML\_Mob Withdrawn

R2-2405162 Considerations on the predicted measurements Nokia discussion Rel-19 FS\_NR\_AIML\_Mob Withdrawn

R2-2405165 RRM measurement prediction Lenovo discussion Rel-19

R2-2405207 Beam prediction related aspects Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405480 RRM measurement prediction for UE sided prediction and NW-sided prediction LG Electronics Inc. discussion FS\_NR\_AIML\_Mob

R2-2405650 Discussion on RRM measurement prediction Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405671 RRM measurement prediction scenarios and sub-use cases Nokia discussion Rel-19

R2-2405674 Considerations on the predicted measurements Nokia discussion Rel-19

R2-2404222 Target scenarios for measurement event prediction NEC discussion

R2-2404372 Discussion on measurement event prediction TCL discussion Rel-19

R2-2404473 Evaluation on AI/ML for Measurement Event Prediction MediaTek Inc. discussion

R2-2404559 Discussion on AI aided measurement events prediction HONOR discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404823 Further Discussion on Measurement Event Prediction Continental Automotive discussion Rel-19

R2-2404905 Data collection for event prediction Sony discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405544 Discussion on measurement event predictions ETRI discussion

R2-2405612 Discussion on measurement event predictions III discussion FS\_NR\_AIML\_Mob

R2-2404348 Discussion on RLF/HOF prediction Fujitsu discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404366 AI/ML HO failure prediction TCL discussion Rel-19

R2-2404367 AI/ML RLF prediction TCL discussion Rel-19

R2-2404631 On RLF and HO failure prediction Apple discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404223 Simulation assumption for RLF prediction NEC discussion

R2-2404268 simulation assumption for RLF prediction Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404309 Simulation assumptions and evaluation methodology for RLF failure prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404602 Discussion on RLF prediction simulation and evaluation methodology Xiaomi discussion

R2-2404696 Simulation assumptions and evaluation methodology for RLF prediction CATT, Turkcell discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404716 Discussion on simulation assumptions of RLF OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404825 Discussions on simulation assumptions and evaluation methodology for RLF/HOF prediction TCL discussion Rel-19

R2-2405031 Discussion on Simulation Assumption and Methodology for RLF prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405066 Discussion on simulation assumption for RLF prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405096 Discussion on methodology for evaluation of RLF/HOF predictions Ericsson discussion FS\_NR\_AIML\_Mob

R2-2405208 Simulation assumptions and evaluation methodology for RLF prediction Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405431 Discussion on simulation assumption for RLF/HO failure prediction KDDI Corporation discussion Rel-19

R2-2405591 Simulation for HOF and RLF Prediction Samsung discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405651 Simulation assumptions and evaluation methodology for RLF/HOF predictions Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405696 Discussion on RLF/HO failure prediction Indian Institute of Tech (M), IIT Kanpur discussion Rel-19

R2-2404269 Areas of interest for RLF/HO failure prediction Intel Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404310 Other aspects related to RLF/HOF prediction vivo discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404428 Discussion on further considerations for AI/ML-based mobility Continental Automotive discussion

R2-2404560 Discussion on HO failure/RLF prediction HONOR discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404597 Discussion on RLF/HOF prediction Samsung Shenzhen discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404603 Discussion on RLF and HOF prediction assumptions Xiaomi discussion

R2-2404697 Consideration on RLF and HO Failure Prediction CATT, Turkcell discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404717 Discussion on RLF and HOF use case OPPO discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2404807 Prediction for HO failure and RLF Lenovo discussion Rel-19

R2-2405004 Discussions on other aspects related to RLF/HOF prediction NTT DOCOMO, INC. discussion Rel-19

R2-2405029 Discussion on other aspects related to RLF and HOF prediction CMCC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405067 Discussion on RLF and HO failure prediction ZTE Corporation discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405075 Discussion on failure prediction NEC discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405097 Discussion on AI/ML based RLF and HOF predictions Ericsson discussion FS\_NR\_AIML\_Mob

R2-2405203 RLF/HO failure prediction Qualcomm Incorporated discussion Rel-19

R2-2405209 Other aspects related to RLF/HOF prediction Interdigital Inc. discussion Rel-19 FS\_NR\_AIML\_Mob

R2-2405303 Discussion on HO failure/RLF prediction Nokia discussion FS\_NR\_AIML\_Mob

R2-2405382 Potential scenarios for RLF/HOF prediction Kyocera discussion Rel-19 R2-2403420

R2-2405477 HOF prediction at UE side LG Electronics Inc. discussion FS\_NR\_AIML\_Mob

R2-2405478 RLF prediction LG Electronics Inc. discussion FS\_NR\_AIML\_Mob

R2-2405545 Discussion on RLF and HO failure prediction ETRI discussion

R2-2405652 Discussion on HOF and RLF prediction Huawei, HiSilicon discussion Rel-19 FS\_NR\_AIML\_Mob