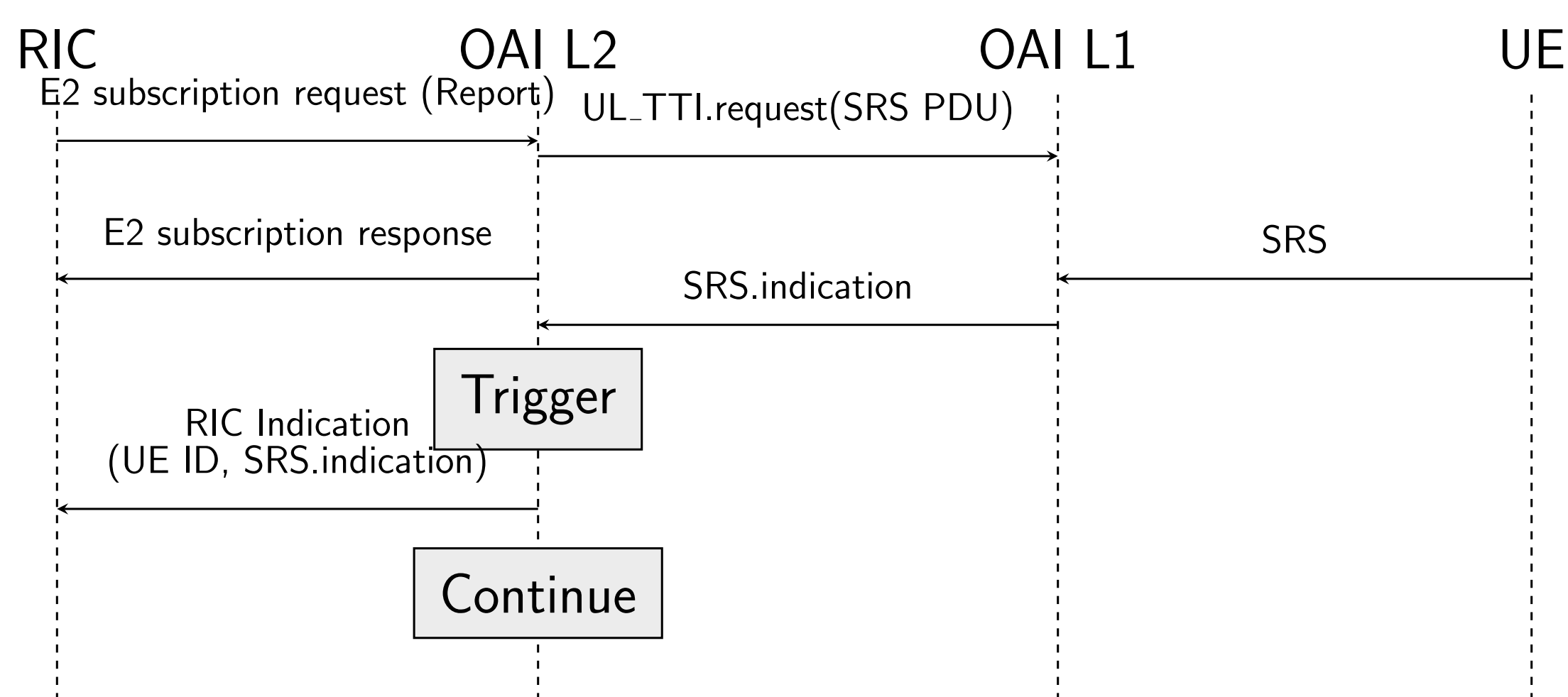
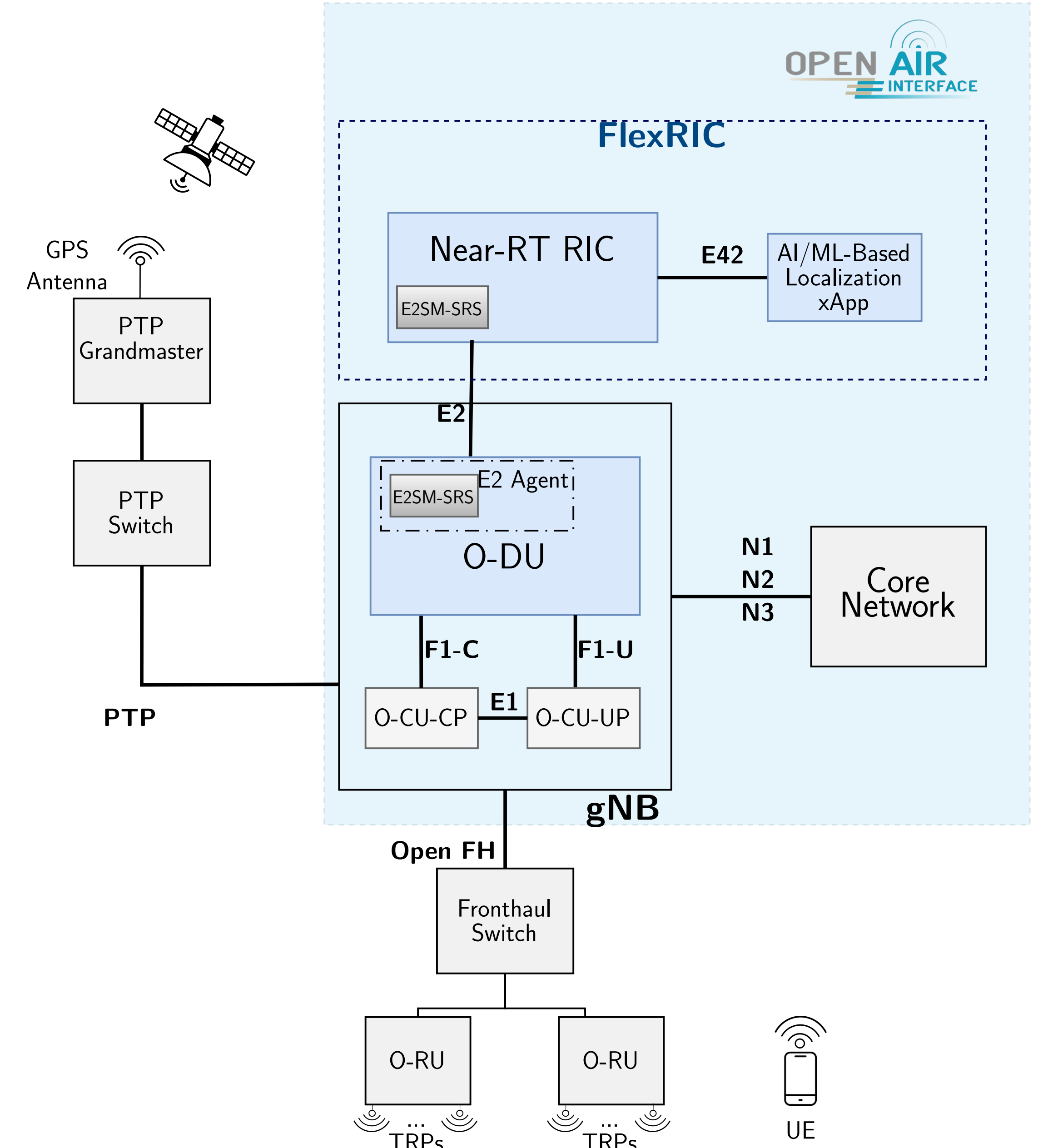


Motivation and Scope

- Positioning is rapidly gaining more importance thanks to the increasing interest in location based services for emerging industry and society applications such as autonomous driving (V2X), industrial IoT (IIoT), and extended reality (XR).
- Standardization Gap:** 3GPP and the O-RAN Alliance do not support AI/ML-Based localization.
- We propose an **O-RAN framework** that enables the integration of AI/ML-based localization algorithms for real-time deployments.

Implementation with OAI and FlexRIC

- E2SM-SRS:** custom O-RAN E2 service model, which re-uses SCF FAPI to expose the UL-SRS channel estimates from the E2 agent to the Near-RT RIC.
- Real-time localization xApp:** leverages the E2SM-SRS in order to execute continuous inference on a pre-trained Channel Charting (CC) model.

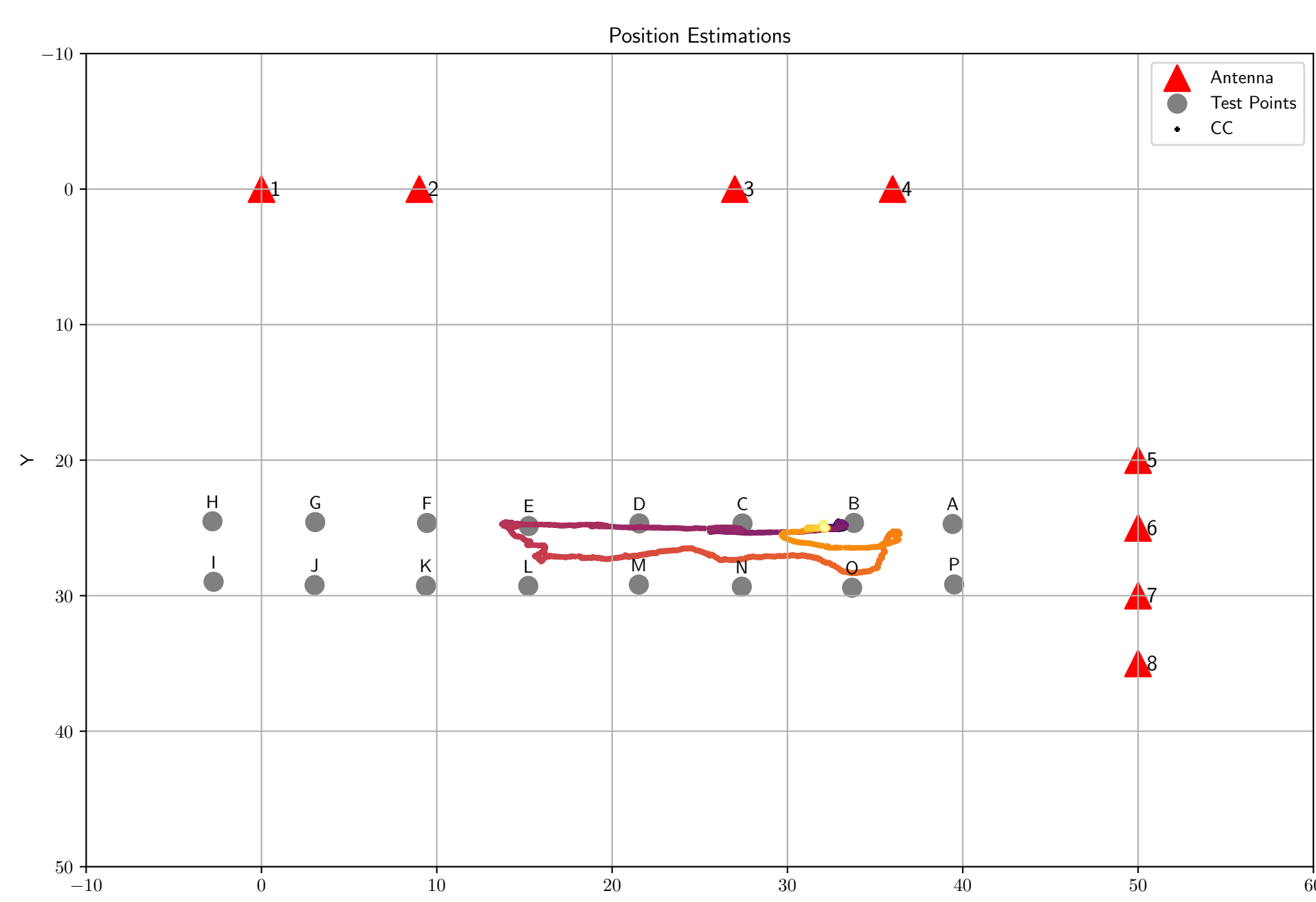
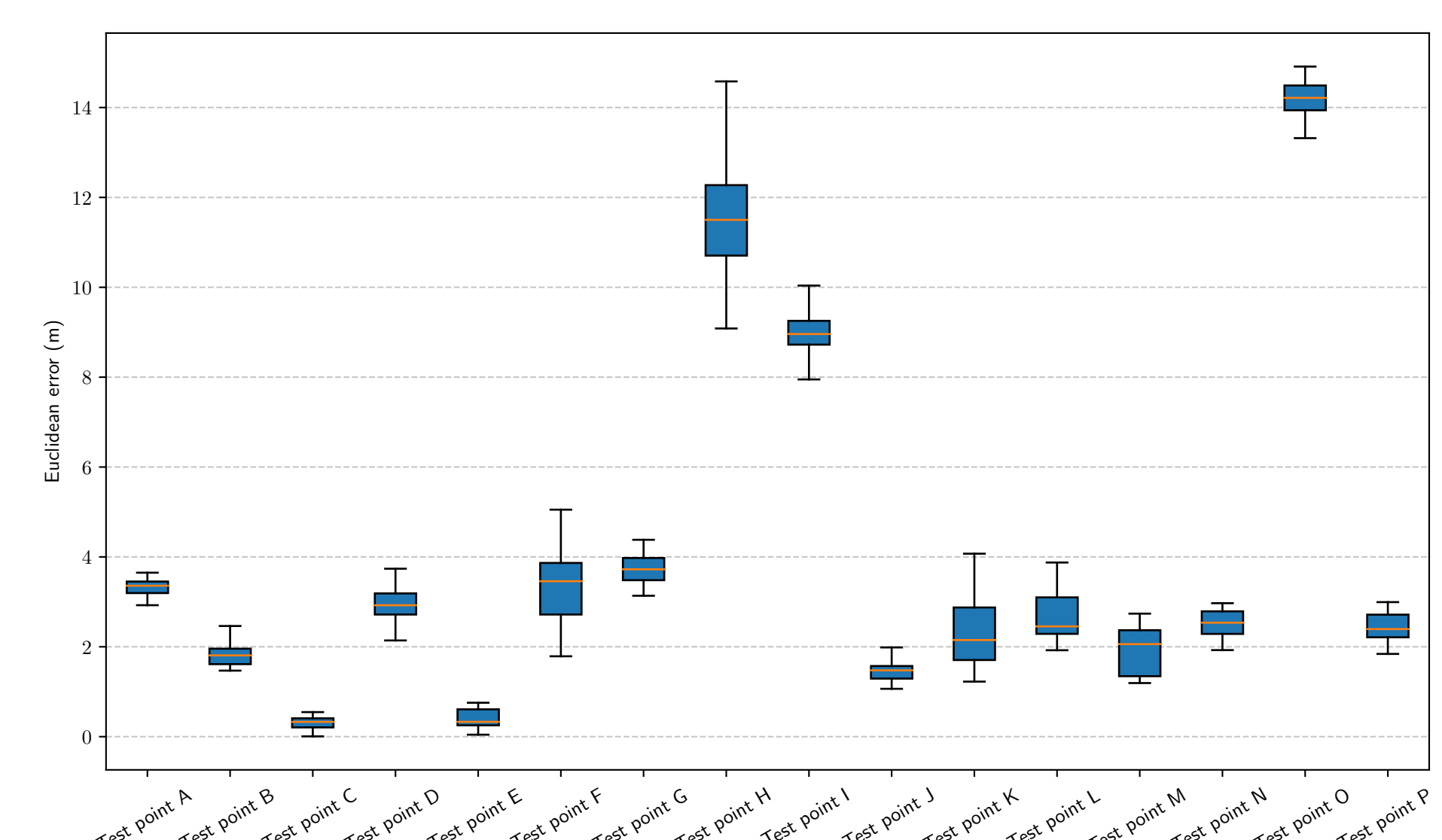


Experiments with the Firecell GEO5G Testbed at EURECOM



GEO-5G Testbed: 2 O-RUs each with 4 distributed TRPs on the south terrace and the north rooftop of EURECOM, with a testing area of size 50m x 10m on the north terrace

Results



Conclusions

- O-RAN framework for enabling next-generation localization and sensing applications.
- Possible integration of different AI/ML-based localization algorithms as xApps.
- Experimental evaluation in real-world conditions.

Future work

- Integration with ray tracing for propagation modeling.
- Integration of ML-based LoS/NLoS detection as an xApp.

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