A miniature 94-GHz radar network in Europe for the Calibration/Validation of the EarthCARE Cloud Profiling Radar L2 data products.

Lukas Pfitzenmaier [1], Pavlos Kollias [1, 2], Alexandra Tatarevic [3], Ulrich Löhnert [1], Susanne Crewell [1]
1. University of Cologne, Cologne, Germany
2. *Stonybrook University, Stony Brook, NY, USA*
3. McGill University, Montreal, QC, Canada

The joined ESA-JAXA EarthCARE features the first Doppler capable 94-GHz Cloud Profiling Radar (CPR), with enhanced sensitivity compared to the CloudSat CPR and improved resolution. These features, especially the availabilityof Doller velocity measurements, are expected to improve the CPR-based detection of clouds, microphysical retrievals in clouds and precipitation and for the first time provide information about convective motion in clouds. As important as the new features of the new CPR are, the development of comprehensive strategies for the evaluation/validation of the L2 CPR products are just as important.
Here, we describe one of these strategies, an ESA funded activity called FMR4RADAR for the development of a 94 GHz miniature Network for EarthCARE Reference Measurement. Within the FMR4RADAR a small ground based 94 GHz radar network is going to be instilled within Europa (FMR4RADAR project – INOE, Bucharest, Romania; SMHI, Narrköping, Sweeden; University of Cologne, Cologne, Germany). Using the ground-based, 94-GHz radar observations and supplemental information from other sensors available at the various sites, ground-based, equivalent versions of the L2 CPR products will be developed. The Cal/Val of the primary observations will be based on procedures similar to those established for the CloudSat CPR.
To validate the EarthCARE retrieval products, a 94-GHz adapted version of the CloudNet algorithm is going to be used. The novelty of this project is that it will give the possibility to monitor the performance of the EarthCARE radar over its entire live time. Therefore, the stability and drifts of the cloud radar can be monitored and calibration/validation standards for future satellite missions developed and installed.