

8.2 OSAKA URBAN PHASED ARRAY RADAR NETWORK EXPERIMENT

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Recent progress of information and communication technologies has been enabling us to realize a rapid scanning radar system. In 2012, Toshiba Corporation and Osaka University succeeded in developing a new type of Phased Array Radar (PAR) system (Yoshikawa et al. 2013, Ushio et al. 2015) under a grant of National Institute of Communication and Information Technology (NICT), and installed in Suita Campus, Osaka University. This PAR system can scan the whole sky within 30 seconds up to 60 km in radius over 100 elevation angles with digital beam forming technique, and the initial observation results demonstrate the unique capability of the new PAR system. After its installation, a new clutter mitigation algorithm from adaptive beam forming technique was developed and tested with the PAR system, and succeeded in suppressing not only the ground clutter but also ghost echo from strong precipitation echo nearby more than 20dB. And also the adaptive algorithm was applied to suppress the range sidelobe and showed the sidelobe level of -60dB.

Upon this success, a new experiment started in 2015 under a grant of SIP (Strategic Innovation Promotion Program) to create the Osaka Urban Phased Array Radar Demonstration Network. The main sensor of the Osaka Network is a 2-node Phased Array Radar Network and lightning location system. In this experiment, data products including reflectivities, VIL (Vertically Integrated Liquid water content), precipitation rates and others are transferred to Osaka Local Government in real time to prevent water related natural hazards. In this presentation, system architecture and some results are presented.