



Dual Ka-band radar experiment for GPM DPR algorithm development

Kenji Nakamura (1), Masanori Nishikawa (1), Haruya Minda (1), Shuji Shimizu (2), Katsuhiko Nakagawa (3), and Hiroshi Hanado (4)

(1) Nagoya University, Hydrospheric Atmospheric Research Center, Nagoya, Japan (nakamura@hyarc.nagoya-u.ac.jp, 81 52 7893436), (2) Earth Observation Research Center, Japan Aerospace Exploration Agency (shimizu@jaxa.jp), (3) Applied Electromagnetic Research Center (nakagawa@nict.go.jp), (4) Okinawa Subtropical Environment Remoto-Sensing Center (hanado@nict.go.jp)

A dual Ka-band radar system is developed by the Japan Aerospace Exploration Agency (JAXA) for the GPM DPR algorithm development. The dual Ka-radar system which consists of two identical Ka-band radars can measure both the specific attenuation and the equivalent radar reflectivity at Ka-band. Those parameters are important particularly for snow measurement. Using the dual Ka-radar system along with other instruments, such as a polarimetric precipitation radar, a windprofiler radar, ground-based rain measurement systems, the uncertainties of the parameters in the DPR algorithm can be reduced. The verification of improvement of rain retrieval with the DPR algorithm is also included as an objective.

Currently the dual Ka-band radar system is at the Okinawa Subtropical Environment Remote Sensing Center, the National Institute of Information and Communications Technology (NICT). There, simultaneous observation of rain with a C-band polarimetric Doppler radar and ground rain observation instruments is ongoing. The radar is a FMCW system with a relatively low transmitting power of 100 W, and two offset parabolic antennas for transmission and reception which enable simultaneous transmission and reception. The system is highly digitized and has flexibility to adjust system parameters with observations, having three observation modes: (1) nominal mode with 15 km observation range, 50 m range resolution, (2) long range mode with 30 km observation range, and (3) a high sensitivity mode with 250 m range resolution.

The performance of the dual Ka-band radar system and a preliminary result will be presented.