

Dual Ka-band radar field campaign for GPM/DPR algorithm development

Katsuhiro Nakagawa^{1*}, NISHIKAWA, Masanori², NAKAMURA, Kenji², KANEKO, Yuki³, HANADO, Hiroshi¹, MINDA, Haruya², OKI, Riko³

¹National Institute of Information and Communications Technology, ²Hydrospheric Atmospheric Research Center, Nagoya University, ³Earth Observation Research Center, Japan Aerospace Exploration Agency

Dual Ka-band radar system is developed by the 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 wind-profiler radar, ground-based precipitation 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. Observations using the dual Ka-radar system were performed in Okinawa Island, in Tsukuba, over the slope of Mt. Fuji, in Nagaoka, and in Sapporo, from 2011 to 2013. Through those experiments the main results are the $k-Z_e$ relationships on various precipitation types. The feasibility of total attenuation in melting layer has been studied. Different $k-Z_e$ relationships have been obtained in snow observations. The vertical variations of rainfall are also analyzed for the DPR algorithm development.

Keywords: GPM/DPR, Ground Validation, Ka-band Radar, k-Z relationship