

10.1 GPMS DUAL-FREQUENCY PRECIPITATION RADAR (DPR) ALGORITHM AND MEASUREMENT OF ICE PRECIPITATION

T. IGUCHI¹, R. OKI², N. KAWAMOTO³

¹ National Institute of Information and Communications Technology, Japan

² Japan Aerospace Exploration Agency, Japan

³ Remote Sensing Technology Center of Japan, Japan
iguchi@nict.go.jp

The Dual-Frequency Precipitation Radar (DPR) onboard the GPM's core satellite is the first spaceborne precipitation radar that uses matched beams of two frequencies to retrieve precipitation profiles. The DPR consists of Ku-band and Ka-band radars whose scattering volumes are matched. But it does not have polarimetric or Doppler capability. The measurable parameters are the profiles of radar reflectivity factors at two frequencies only. The presentation will describe how the backscattered signals at two frequencies are used to correct for the attenuation and to estimate the rainfall rate in the latest standard algorithm.

While accurate estimation of precipitation rates with the DPR is one of the major objectives of the GPM mission, detection of ice precipitation with the DPR is also an important objective. After the satellite launch, distinguishing ice precipitation echoes from water precipitation echoes in convective storms turned out to be much more difficult than we originally anticipated before launch. The difficulty originates from several factors that include the non-uniform beam filling of precipitation, many possible kinds of ice particles, and uncertain temperature profiles. The presentation will mention the current status of algorithm development for detection of ice precipitation and quantification of its parameters.