



All-sky Microwave Radiance Assimilation in the Korean Integrated Model (KIM) system

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All-sky microwave radiance assimilation system has been developed in the Korean Integrated Model (KIM) analysis system. Initially, RTTOV-SCATT (version 11.3; Bauer et al., 2006; Geer et al., 2014) modules were implemented to assimilate the Microwave Humidity Sounder (MHS), Advanced Technology Microwave Sounder (ATMS), Sondeur Atmosphérique du Profil d'Humidité Intertropicale par Radiométrie (SAPHIR) and FY-3C Microwave Humidity Sounder-2 (MWHS) 183 GHz channels over ocean. A system development methodology for assimilating cloud and precipitation-affected satellite radiances has been developed in accordance with the ECMWF approach (Geer et al., 2014). There is no cloud or precipitation control variable, but in the minimization, cloud and precipitation are diagnosed from the dynamical and humidity fields every time-step including the first. In this study, the clear-sky and all-sky contributions to the assimilation of MHS are separated. The clear-sky assimilation shows the significant forecast benefits, but the all-sky assimilation is testing. Cloud and precipitation parameters are not directly assimilated in our system, but only temperature and humidity profiles are improved in the all-sky assimilation.