

DATA ASSIMILATION EXPERIMENTS OF RADIO OCCULTATION DATA USING THE JMA MESO-4DVAR SYSTEM -IMPACTS ON THE HEAVY RAINFALLS IN JAPAN AND THE GENERATION OF TYPHOON-

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Heavy rainfalls and typhoons cause disasters in Japan almost every year. Because water vapor over the sea that is supplied to the heavy rainfalls and typhoons maintains them, it is important to understand the water vapor distribution over the sea. Due to the uniform distribution of GPS radio occultation (RO) data, they are expected to be useful assimilation data. To use GPS RO data as assimilation data, the Meteorological Research Institute (MRI) and Japan Meteorological Agency have developed the assimilation method of GPS RO data. In the method developed in MRI, the slant-path data were assimilated while taking the vertical correlation of observation error into consideration, because the water vapor is not always distributed uniformly and the vertical resolution of slant paths are as high as several ten meters. This method was applied to both the heavy rainfall that occurred in Central Japan, and to the typhoon in the generation stage. When GPS RO data was assimilated, the rainfall intensity was intensified and became closer to the observed one. When the ground-based GPS data and GPS RO data were assimilated simultaneously, the forecast result was further improved. The typhoon Usagi, which was not developed from the initial fields produced by the interpolation of GSM data, was developed by assimilation of GPS RO data. The results of these experiments show that GPS RO data has the potential to improve the numerical forecasts of heavy rainfalls and typhoons.