



Development of GNSS PWV information management system for very short-term weather forecast in the Korean Peninsula

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Over the past decade, Global Navigation Satellite System (GNSS) was in the spotlight as a meteorological research tool. The Korea Astronomy and Space Science Institute (KASI) developed a GNSS precipitable water vapor (PWV) information management system to apply PWV to practical applications, such as very short-term weather forecast. The system consists of a DPR, DRS, and TEV, which are divided functionally. The DPR processes GNSS data using the Bernese GNSS software and then retrieves PWV from zenith total delay (ZTD) with the optimized mean temperature equation for the Korean Peninsula. The DRS collects data from eighty permanent GNSS stations in the southern part of the Korean Peninsula and provides the PWV retrieved from GNSS data to a user. The TEV is in charge of redundancy of the DPR. The whole process is performed in near real-time where the delay is ten minutes. The validity of the GNSS PWV was proved by means of a comparison with radiosonde data. In the experiment of numerical weather prediction model, the GNSS PWV was utilized as the initial value of the Weather Research & Forecasting (WRF) model for heavy rainfall event. As a result, we found that the forecasting capability of the WRF is improved by data assimilation of GNSS PWV.