



A preliminary study for creating precipitable water vapor maps using GPS

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In order to monitor global weather changes and improve numerical weather prediction models, precise knowledge of the water vapor content is required. The satellite instruments such as Atmospheric Infrared Sounder (AIRS) are being used to measure the water vapor in wide area. But their spatial and temporal resolutions are lower than ground-based instruments such as radiosondes and GPS. In this preliminary study, we generated and validated the interpolated Total Precipitable Water (TPW) at sites without water vapor observing instruments by utilizing GPS measurements in order to create TPW maps for South Korea. The two interpolation methods (inverse distance weighting and height-weight method) were used to calculate TPW at the stations without GPS observations. The accuracy validation of interpolated values is performed using radiosonde TPW. In the case of the station without radiosondes, the TPW from the AIRX2RET data was used to evaluate the interpolated GPS TPW. The AIRX2RET is the standard retrieval products using AIRS and Advanced Microwave Sounding Unit (AMSU) sensors onboard the Aqua mission. In order to evaluate the accuracy of AIRS TPW provided by AIRX2RET, Root Mean Square Error was calculated using the eight GPS stations located in South Korea.