

Implementation of GPS-RO data processing system for data assimilation

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The data preprocessing and quality control modules for bending angle measurements of global positioning system radio occultation (GPS-RO) have been implemented and examined. GPS-RO data processing system is composed of several steps for checking observation locations, missing values, physical values for Earth radius of curvature, and geoid undulation. An observation-minus-background check is implemented by use of a one-dimensional observational bending angle operator and tangent point drift is also considered in the quality control process. We have tested GPS-RO observations utilized by the Korean Meteorological Administration (KMA), based on both the KMA global model and the National Center for Atmospheric Research (NCAR) Community Atmosphere Model-Spectral Element (CAM-SE) as a model background. Background fields from the CAM-SE model are incorporated for the preparation of assimilation experiments with LETKF data assimilation system, which has been successfully implemented to a cubed-sphere model with fully unstructured quadrilateral meshes. As a result of data processing, the bending angle departure statistics between observation and background shows significant improvement. Also, the first experiment in assimilating GPS-RO bending angle within LETKF data assimilation system shows encouraging results.