

Title : Retrieval of Water vapor with COSMIC data by using 1D-var analysis and comparison with different observational platforms (Aqua, COSMIC, NCEP and ECMWF)

(1D-Var解析によるCOSMICデータからの水蒸気高度分布の導出及び他観測(Aqua, NCEP, ECMWF)との比較検証)

Speaker : I. V. Subba Reddy

Collaborators : Prof. T. Tsuda, Dr. Jun-ichi Furumoto, RISH, Kyoto University

Related Mission : 1 (Assessment and remediation of the humanosphere)

Abstract

The COSMIC satellite data is most useful to study the variation of water vapor (WV) because of global coverage with high spatial resolution of about 100 m in the troposphere. To retrieve the WV from the COSMIC data we used 1D-var analysis with Global Spectral Model of Japan Meteorological Agency (GSM-JMA) as an initial value. Cosmic provides ~2000-2500 profiles per day and per month an average there are ~60000-75000 profiles are available. By using 1D-var analysis we retrieved the WV profiles from September 2006- September 2007 and the % of retrieved WV profiles are 96 % in compared to COSMIC post processed data. The retrieved profiles were compared with the existing radiosonde data at different locations and the comparison is very good. The difference between the radiosonde and 1D-var analysis is < 0.7 g/kg in the height range 0-10 km. By using these data sets seasonal variability of WV over the latitude +40° and longitude 30°-180° E (which covers India, Indonesia and Australian regions) were studied. The day to day variability of the WV over the Indian, Western Pacific (especially over the Indonesian region) and Australian regions are clearly shown significant difference during the dry and wet seasons. The estimation of WV from the satellites has the potential applications to study the evolution, onset and progression of the Indian summer monsoon. Similar studies can also be carried out over the Indonesian region and to study the Asian summer monsoon. The retrieved WV profiles are compared with the Aqua satellite as well as model data of NCEP and ECMWF data sets. WV estimated from COSMIC and AIRS are in consistent with the NCEP and ECMWF model results. The difference between these observations and their latitudinal and longitudinal variation of WV will be discussed in detail.