



FY-2E IR1 Brightness Temperature's Sensitivity Analysis for Clear Region Atmospheric Motion Vector Derivation from Geostationary Satellite IR Images

Z. Wang (1,2)

(1) Key Laboratory of Meteorological Disaster of Ministry of Education, Nanjing University of Information Science & Technology, Nanjing 210044, P. R.China (eiap@nuist.edu.cn), (2) School of Atmospheric Physics, Nanjing University of Information Science & Technology, Nanjing 210044, P. R. China

The current cloud-tracing technique for atmospheric motion vector derivation would fail in “clear” regions in IR imagery. This paper makes sensitivity analysis on brightness temperatures in thermal IR window channels with respect to water vapor and aerosol contents in the air which might be used as tracers for deriving atmospheric motion wind vectors in clear regions with weak signal tracing technique. The data for sensitivity analysis based on the radiation transfer model LOWTRAN includes MODIS Atmospheric Aerosol products and FY-2E Atmospheric Total Precipitation Water products. The results from the sensitivity analysis show that water vapor and aerosol signals greater than the sensitivity of satellite-borne IR radiometer exist under certain conditions in clear region, and therefore the possibility exists to derive atmospheric motion vectors in clear regions from thermal infrared channel images obtained with FY-2E meteorological satellite.