Effect of Atovs Temperature and Humidity and SSM/I Total Precipitable Water on the Simulation of a Monsoon Depression

M.Govindankutty[1] and A. Chandrasekar[1] *

[1]Department of Physics & Meteorology, Indian Institute of Technology, Kharagpur, India
* Department of Earth and Space Sciences, Indian Institute of Space science and Technology, Thiruvananthapuram, India

The present study explored the effect of assimilation of Advanced TIROS Vertical Sounder (ATOVS) temperature and humidity profiles and Spectral sensor microwave imager (SSM/I) total precipitable water (TPW) on the simulation of a monsoon depression which formed over Arabian Sea during September 2005 using the Weather Research and Forecast (WRF) model. The three dimensional variational (3DVAR) data assimilation technique has been employed for the purpose of assimilation of satellite observations. Statistical parameter like "equitable threat score", "bias score", "forecast impact" and "improvement parameter" have been used to examine the effect of the above mentioned observations on the numerical model. The results of this study implies direct and good evidence of the impact of the assimilation of the satellite observation using 3DVAR on the dynamical and thermo dynamical features of a monsoon depression along with the impact on the spatial pattern of the simulated precipitation associated with the depression. The "forecast impact" parameter calculated for the wind speed gives evidence of the positive impact of the assimilation of ATOVS temperature and humidity profiles and SSM/I TPW on the model simulation; with the assimilation of the ATOVS profiles showing better impact in terms of a more positive value of the "forecast impact" parameter. The results of the study indicate the improvement of the forecast skill in terms of "equitable threat score" and "bias score" due to the assimilation of satellite observation.