

Impact of COSMIC GPSRO assimilation on Indian summer monsoon simulation using variable resolution LMDZ5-DART data assimilation system

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Impact of assimilation of COSMIC GPS radio occultation (RO) data in simulating mean monsoon circulation and rainfall of Indian summer monsoon (ISM) 2015 will be examined in this study using the newly developed LMDZ5-DART ensemble based data assimilation system. The LMDZ5 model is an atmospheric component of the IPSL global model, which has the capability to generate denser grids over an area of interest using coordinate stretching. This unique feature of the model enables its use for finer regional scale simulations without increasing the number of grid points. The Indian summer monsoon is the strongest component of the global monsoon system and monsoon circulations are important to the Indian and surrounding region because they provide a significant fraction of seasonal rainfall. Much of the Indian Ocean is characterized by a lack of in situ measurements; thus, numerical models rely on remote sensing data and prior forecasts to generate an analysis over this region. The COSMIC GPSRO measurements provide globally distributed atmospheric refractivity soundings including over the Indian Ocean. The GPSRO measurements have relatively high vertical resolution compare to satellite radiances in the lower troposphere and are not contaminated by clouds or precipitation. Hence, This study will explore the improvement in ISM simulation using assimilating GPSRO data on top of the observations, which is being used in NCEP/NCAR reanalysis. Two experiments will be performed; the first one is the control experiment where only observations from NCEP/NCAR reanalysis will be assimilated, and the second one is similar to the first experiment, but also GPSRO data are assimilated in LMDZ5-DART system. The results from above experiments will be presented at the conference.

Keywords: Data Assimilation, COSMIC GPSRO, Indian summer Monsoon