## STUDY OF MONSOON WITH THE IMPACT OF AEROSOLS IN LMDZ GENERAL CIRCULATION MODEL

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## Abstract

The daily progress of southwest monsoon 2007 has been studied using daily SST from PODAAC (optimally interpolated) and initial conditions (at 00 GMT) from NCEP (National Centers for Environmental Prediction) analyses. It has been noted from a series of 30-day runs of LMDZ that the model predicted monsoon onset conditions well in advance, along with all the major weather events of this region. Thus, it has shown the capability to correctly predict the date of monsoon onset over Kerala. The first series of numerical experiments with the model were performed at 128x96x19 resolution. Later on, 16-day runs at 192x145x19 resolution were performed. A limited area resolution model (grid size = 20 km), also derived from LMDZ, has been developed at IIT Delhi, which is being proposed to run along with the global model for studying monsoon behaviour over major cities of India. The rainfall has been calculated over all these cities and has been compared with India Meteorological Department real observations. It has been also compared with ECMWF (European Centre for Medium-Range Weather Forecasts) and NCEP results. Ion induced nucleation mechanism has been implemented into threedimensional interactive chemistry global model, Laboratoire de Méteorologie Dynamique General Circulation Model (LMD-GCM, version 3.3). RETRO (Reanalysis of the TROpospheric chemical composition over the past 40 years) DATA for various species (CO, NOx, Organic Carbon, Black Carbon, Total Carbon, Particulate matter 2.5 µm, Total particulate matter, SO2, NH3, N2O, CH4) has been taken from GEIA (Global Emission Inventory Activity), France. Dust aerosols datasets has been taken from NASA. These data has been interpolated over the model grid and simulated over the globe at 96x72x19 resolution with 19 tracers for 30-day runs. Here, the GCM simulated monsoon results without and with the impact of aerosols has been studied and compared.





RAIN on 17 July 2007 00 GMT (850 mb)1



RAIN on 28 June 2007 00 GMT 1

15N 10N

Q

1



RAIN on 20 July 2007 00 GMT (850 mb) 4

3/F 20 40

80 15/

35%





RAIN on 29 June 2007 00 GMT 2





RAIN on 21 July 2007 00 GMT (850 mb) 5



RAIN on 22 July 2007 00 GMT (850 mb) 6