Impact of NOAA Radiances over Bay of Bengal Tropical Cyclones

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Tropical Cyclones are known for their devastating nature with extremely powerful winds, torrential rain, high waves accompanied with storm surge and tornadoes. Devastating nature of tropical cyclones over life and property makes its prediction with sufficient lead time an inevitable challenge to the scientific community. Most important is the track prediction withminimum errors. Numerical weather prediction plays an important and most powerful tool forthe cyclone track prediction especially for the Bay of Bengal cyclones, which are characterized by short life span.

In the present study, the impact of NOAA radiances over Tropical Cyclone simulation has been studied. Two Tropical Cyclone cases (NARGIS - 27th April to 3rd May, 2008 and AILA - 23rd to 26th May, 2009) over Bay of Bengal have been selected. Aila was a severe cyclonic storm following the usual climatological track of the season whereas Nargis was a very severe cyclonic storm showing recurvature and unusual movement. NCEP's Gridpoint Statistical Interpolation (GSI) analysis scheme has been used for the assimilation accepting first guess from the NCAR's meso-scale code WRF-ARW's 6 hour forecast. GSI has been run in 6 hourly intermittent cycles coupled with the WRF-ARW in horizontal resolution of 27 km. and 37 sigma levels in the vertical. Two sets of simulation has been carried with (EXP) and without (CTRL) the NOAA radiances. In both the experiments, the prepbufr file created in NCMRWF (National Centre for Medium Range Weather Forecasting) has been used as the observational base. The analysis so formed at 00Z of each day has been used by WRF-ARW as the initial conditions for the next 72hr forecast. The boundary conditions both during the assimilation cycles and forecasts have been accepted from the NCMRWF's global model (T254L64 - horizontal truncation of wave number T254 and with 64 levels in vertical) forecasts. During the forecasts the boundary conditions has been updated every 6 hour. The impact of the NOAA radiances in the dynamical and physical processes of the cyclones has been studied in detail.