Numerical simulation of ‘PHYAN’: Sensitivity to nested domain & Initial condition

R. D. Kanase and P. S. Salvekar
Indian Institute of Tropical Meteorology, Pune-411008, India

Objective
Sensitivity of WRF model to nested approach and sensitivity to initial condition on the prediction of track and intensity of tropical cyclone ‘PHYAN’ (9-11th Nov. 2009).

Introduction
Accurate prediction of track and intensity of a tropical cyclone is a challenging task. Its track and intensity can be affected by (i) internal dynamics, (ii) thermodynamics, (iii) the formation and distribution of clouds & precipitation, and (iv) the interaction between cyclone & its large scale environment. However, the sensitivity to nested approach & to initial condition are not yet well understood. Present work mainly focuses on these issues (Total 5 expts ) keeping outer domain unchanged.

Results

Nested approach

Initial Condition

Conclusions
➢ Sensitivity of tropical cyclone forecasts, including track and intensity is investigated with respect to nested approach and with different initial conditions using WRF model.
➢ The model results indicate that the higher resolution with nesting shows significant improvement in the track of cyclone.
➢ Also the simulated results are improved when the model integration is started from formation of low.

References

Acknowledgement: Authors acknowledge Director, IITM for his encouragement and Mesoscale and Microscale division of NCAR for providing WRF modeling system for present study. Authors also thank NCEP High Resolution Global Forecast System and IMD for providing real time large scale analysis and best-fit track of the storm.