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
e-mail: k_radhika@tropmet.res.in , pss@tropmet.res.in

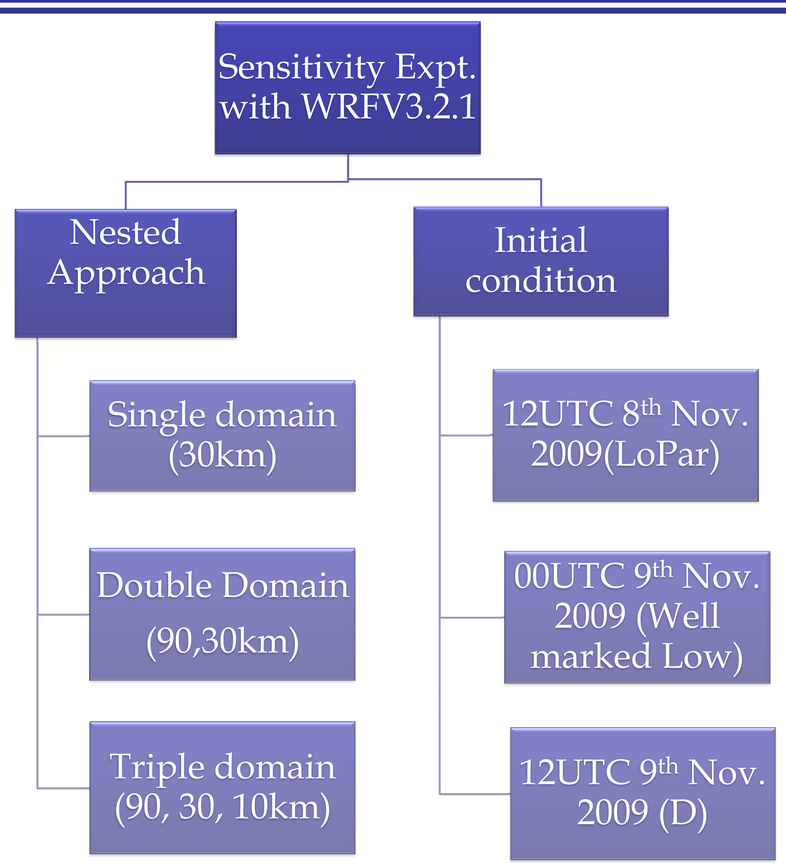
Objective

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.

Model & Experiments



Dataset : NCEP FNL Reanalysis (1^0X1^0)

CPS- Kain-Fritsch

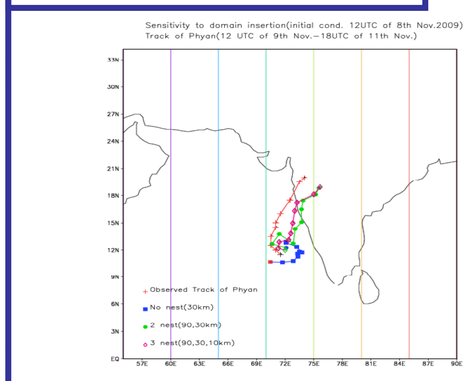
MPS – WSM3 simple ice microphysics

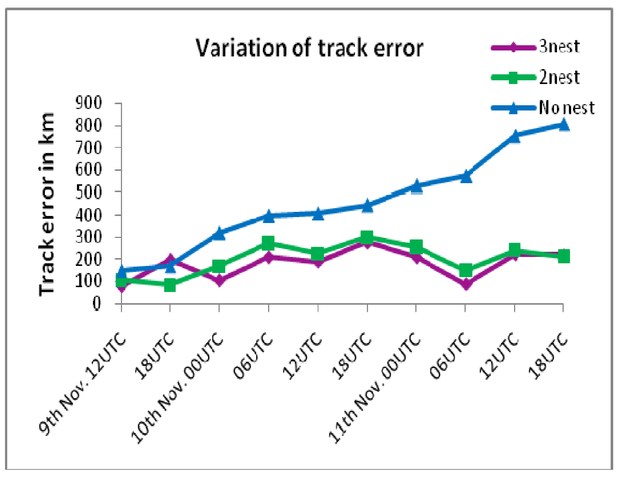
PBL scheme- YSU

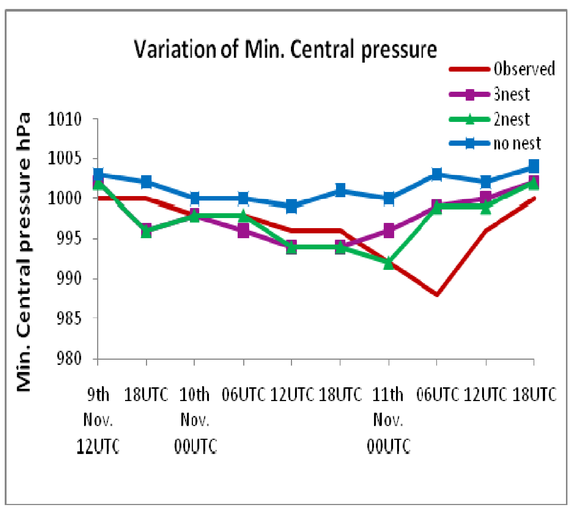
End time - 18UTC of 11th Nov. 2009

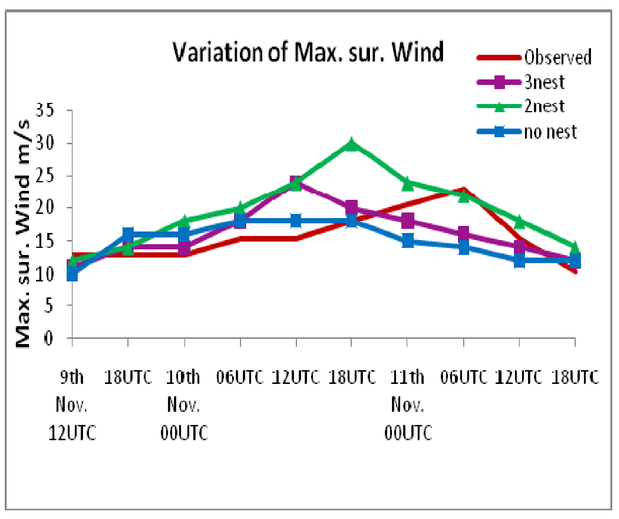
Results

Nested approach

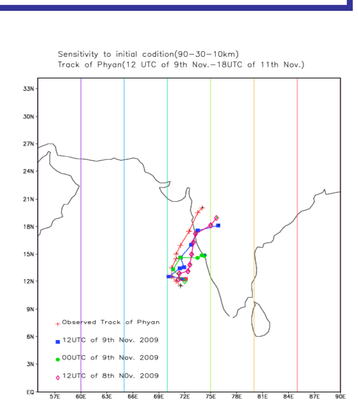


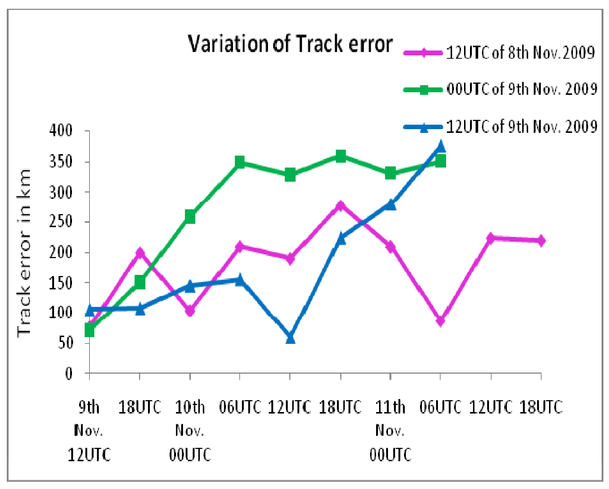


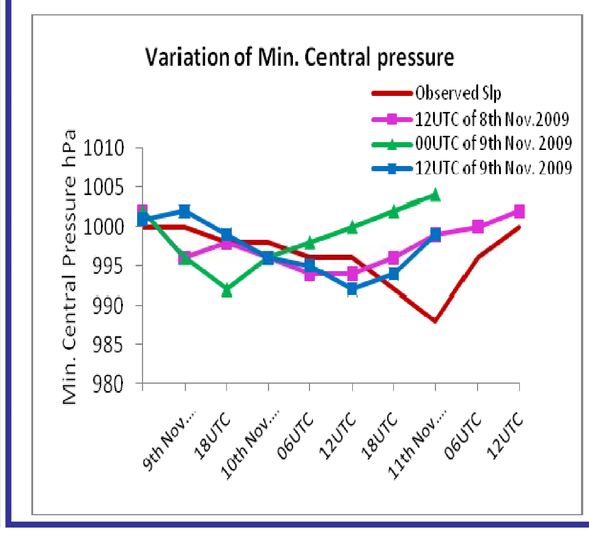


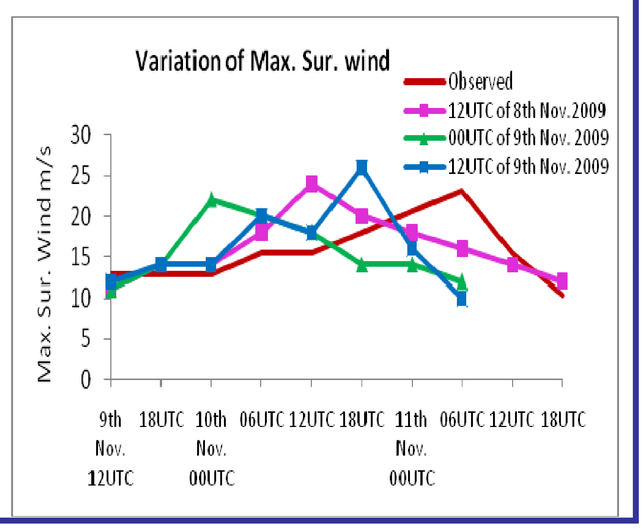


Initial Condition









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

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