



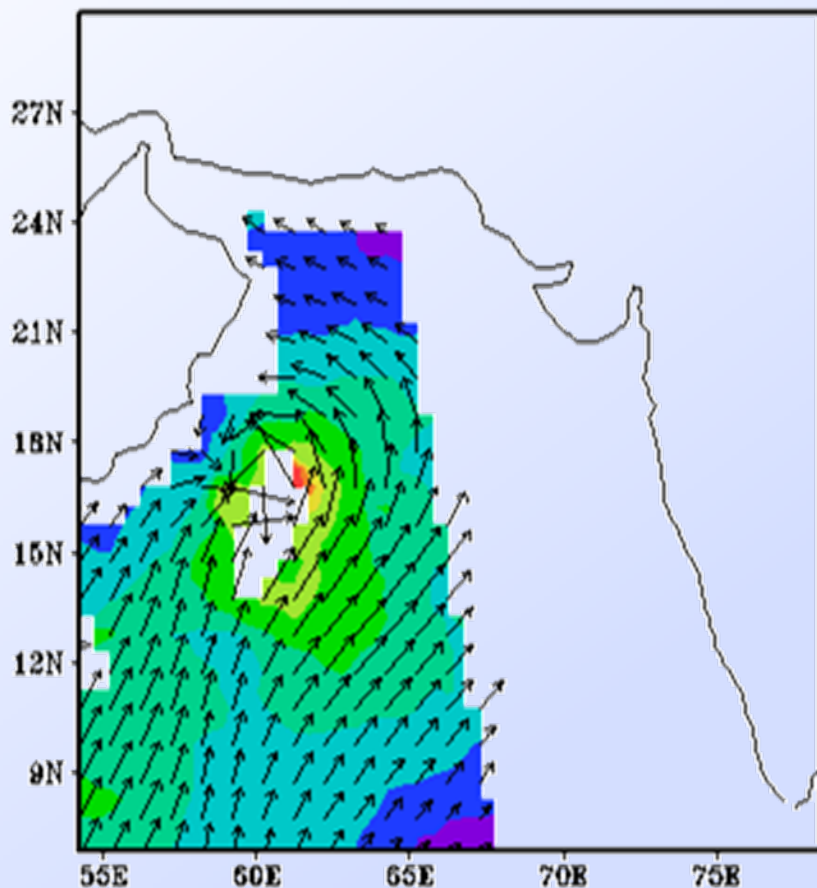
Impact of Oceansat-II Scatterometer Winds and TMI Observations *on* PHET Cyclone Simulation

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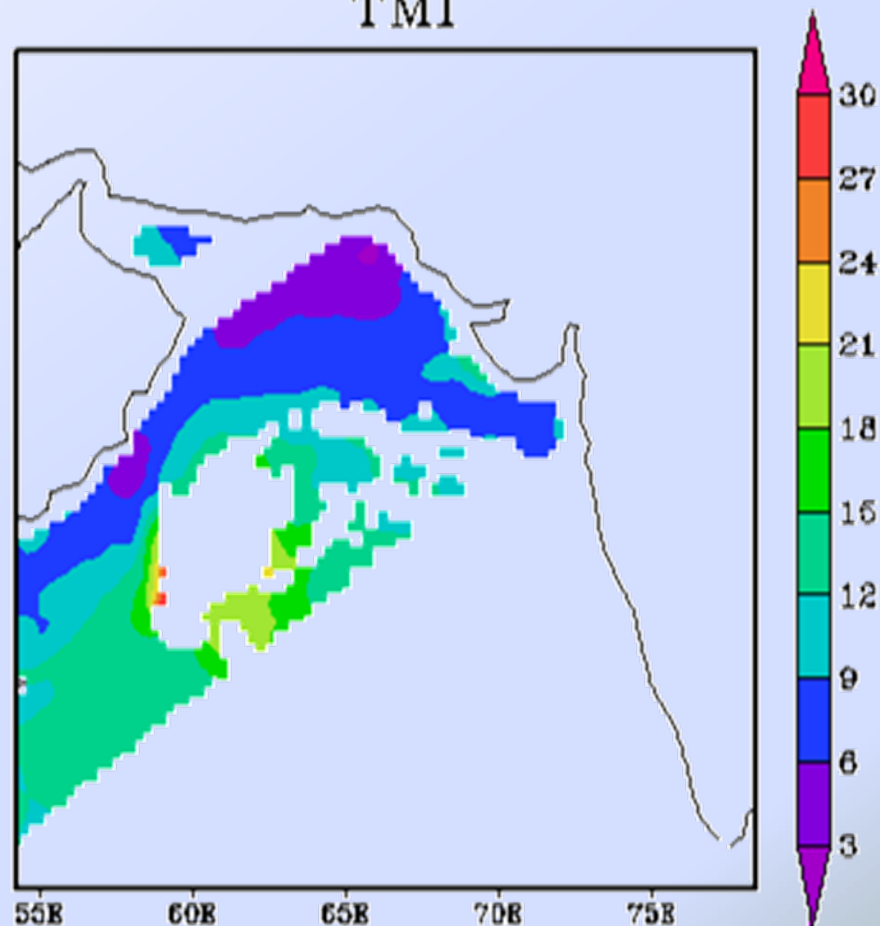
SATELLITE WINDS (m/s) – 01 JUNE 2010 1800 UTC

OCEANSAT – II SCATTEROMETER



→ 20 m/s

TMI



NCEP GDAS Analysis ($1^\circ \times 1^\circ$) and Conventional Data

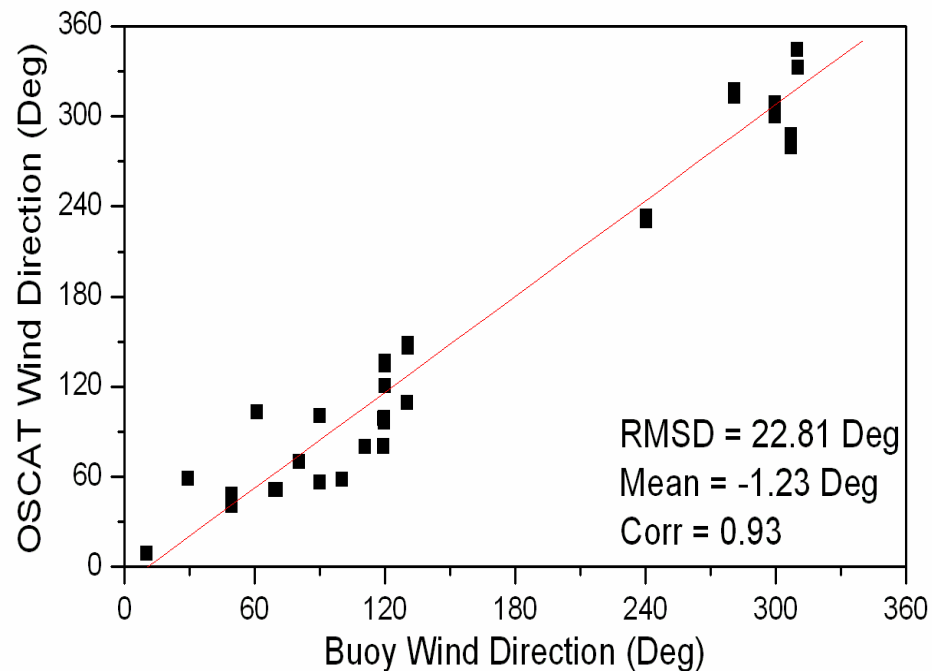
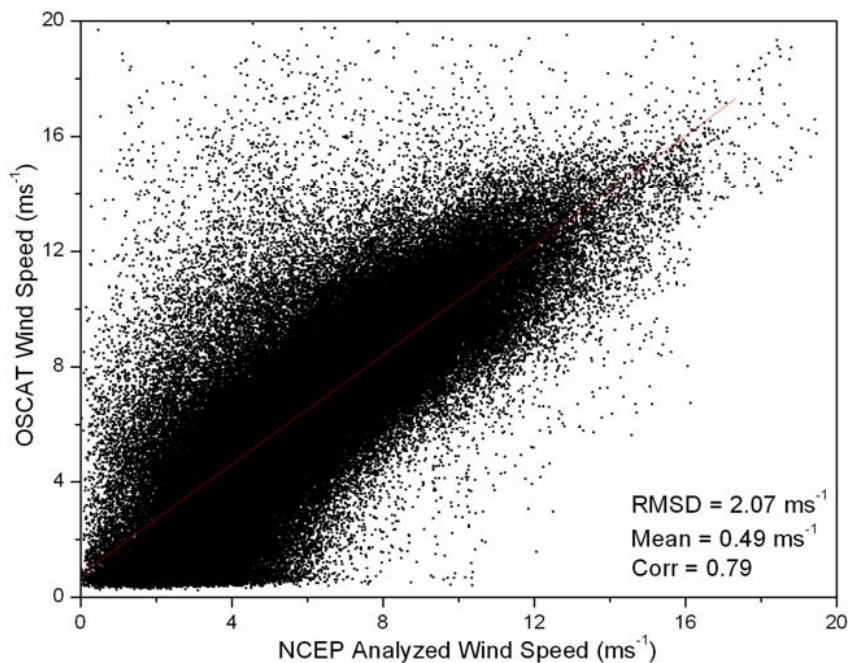
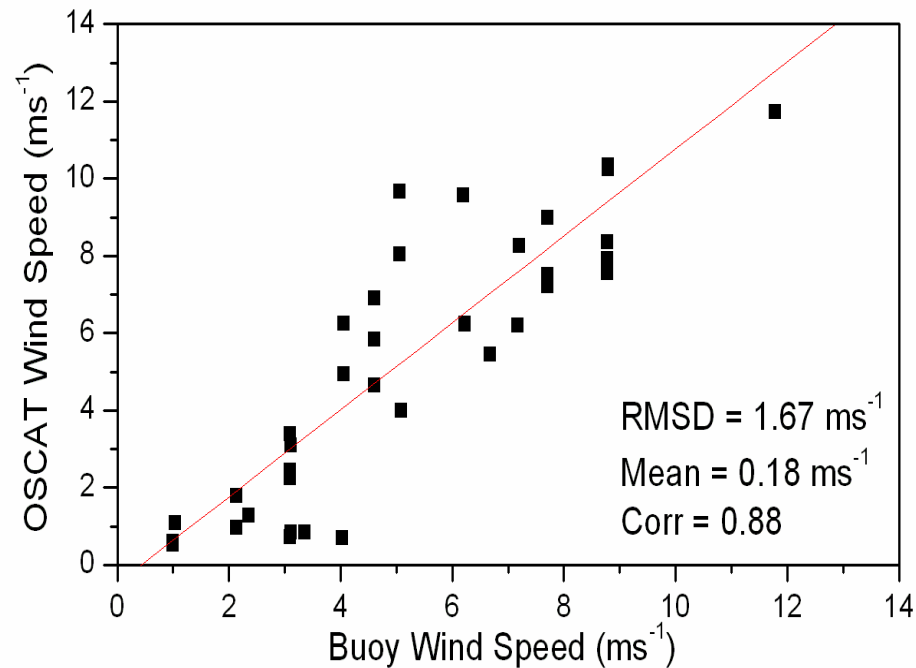


Assimilated Data for each Numerical Experiment

Numerical Experiment	DATA
CNT	6HR WRF forecast from 01 Jun 2010 1200 UTC + Conventional data.
TMIWS	CNT + TMI wind speeds only.
TMIWSPW	CNT + TMI wind speeds and total precipitable water.
OSCAT	CNT + Scatterometer Wind Direction and speed.
OSCATTMIPW	OSCAT + TMI total precipitable water.
NDOSCAT	CNT + Scatterometer Wind speed only.
ALL	CNT + TMIWSPW + OSCAT.



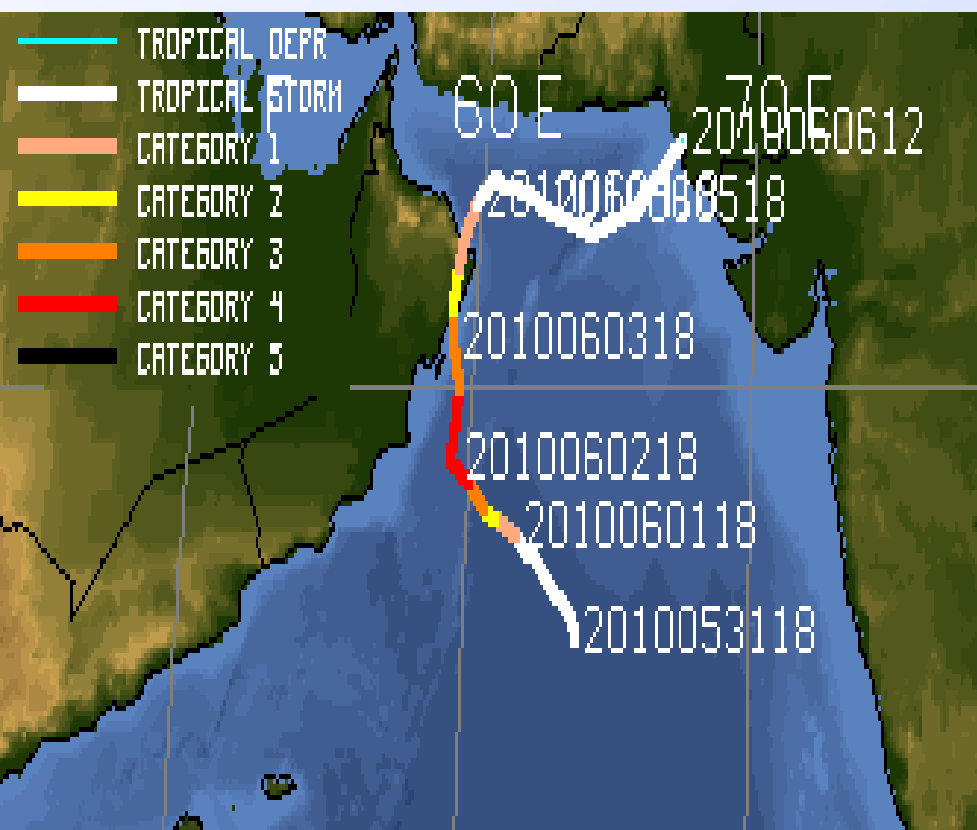
Comparison of Oceansat-2 winds with Buoy and NCEP Analyzed winds



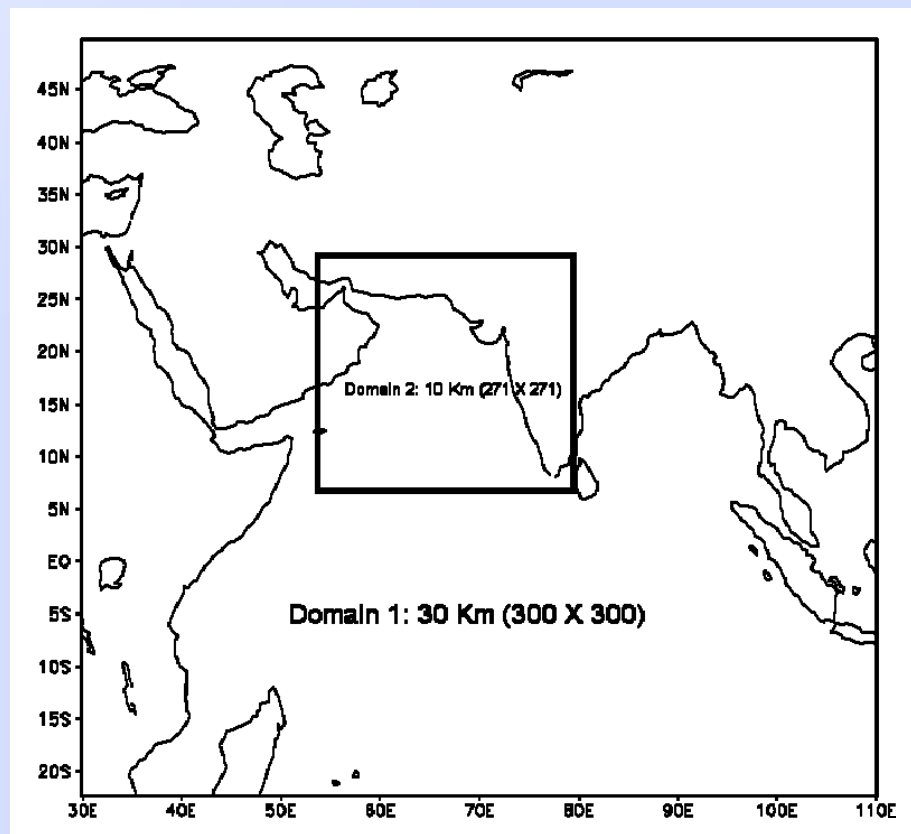
Case Study and Methodology

Model: WRF version 3.2 and WRF 3D-Var

Domain: Two Way Nested Domain (30 and 10 Km)



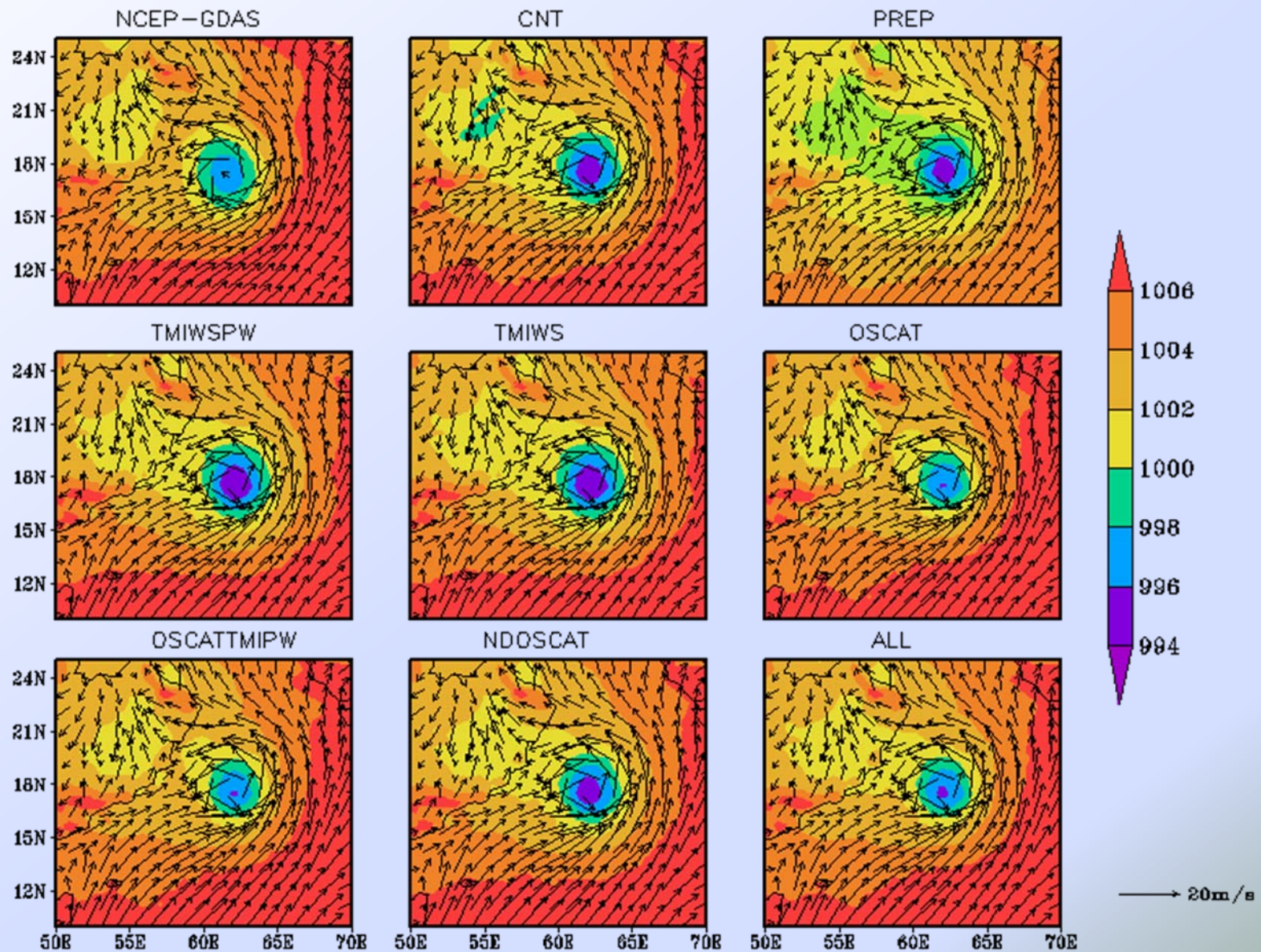
Source-JTWC observed Track



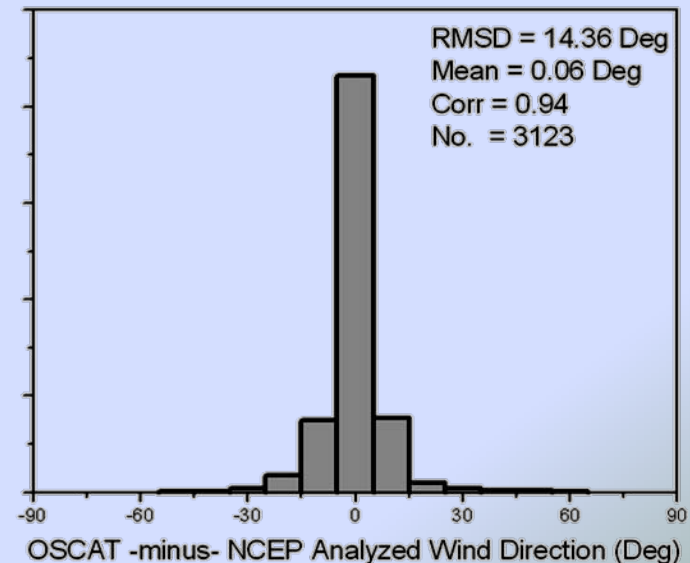
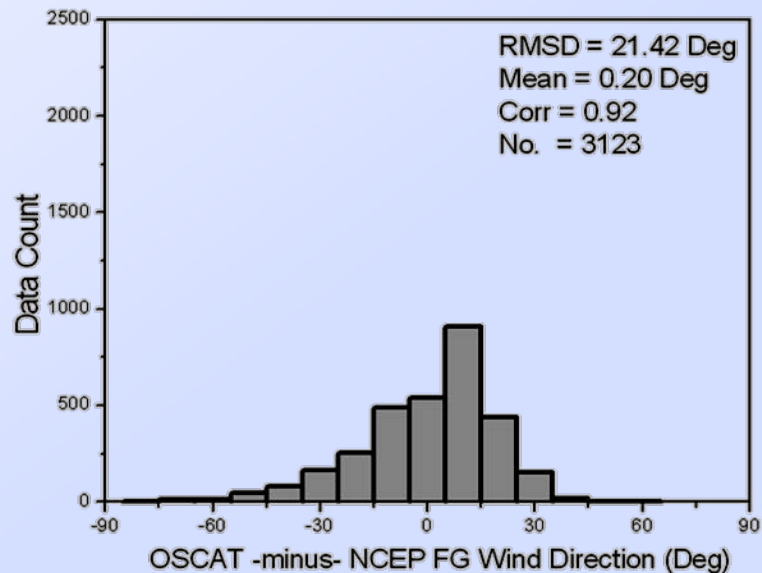
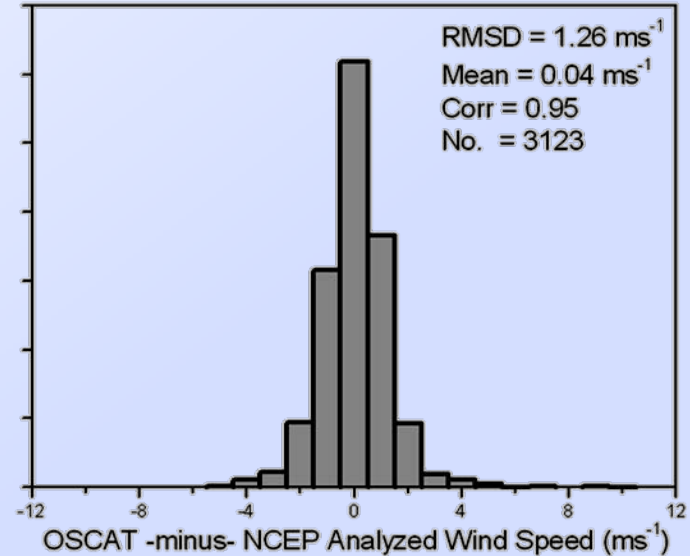
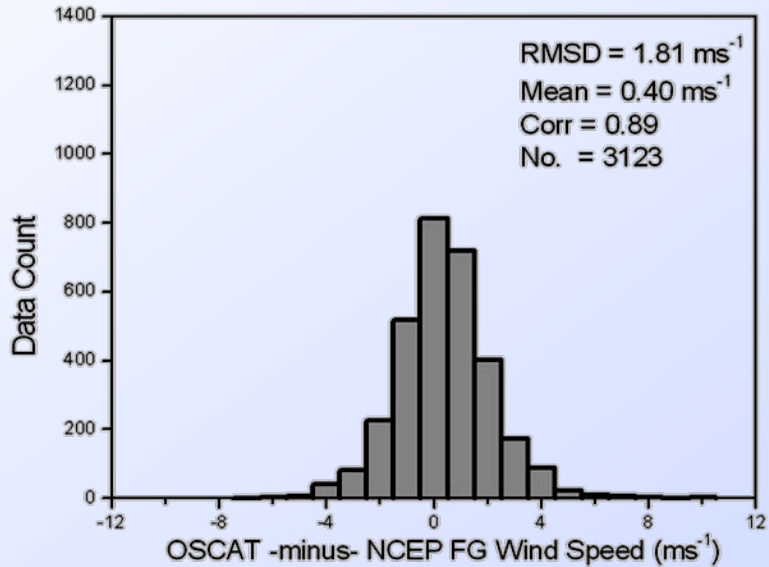
Domain used in the numerical simulation

Some Results: Various Initial Conditions

PHET CYCLONE - MSLP (hPa) & 10 METRE WINDS (m/s) - 01 JUN 2010 1800 UTC

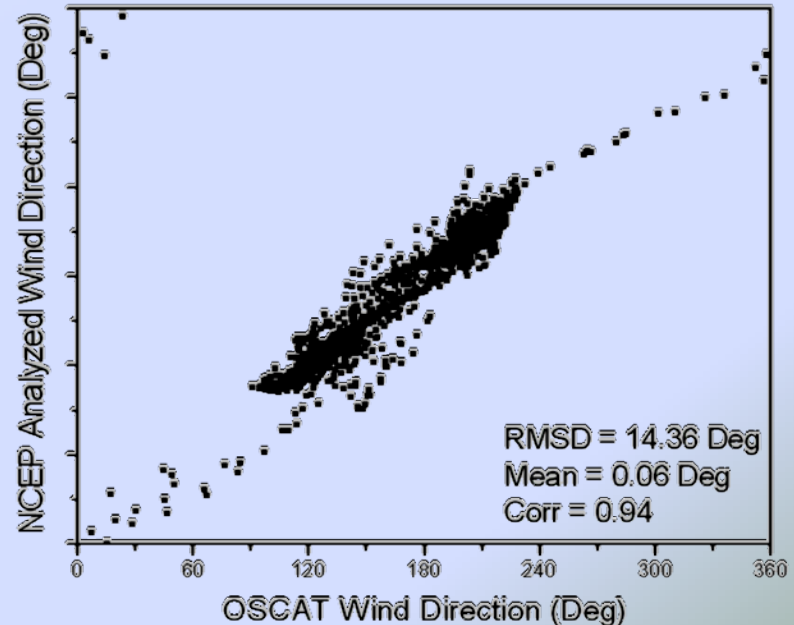
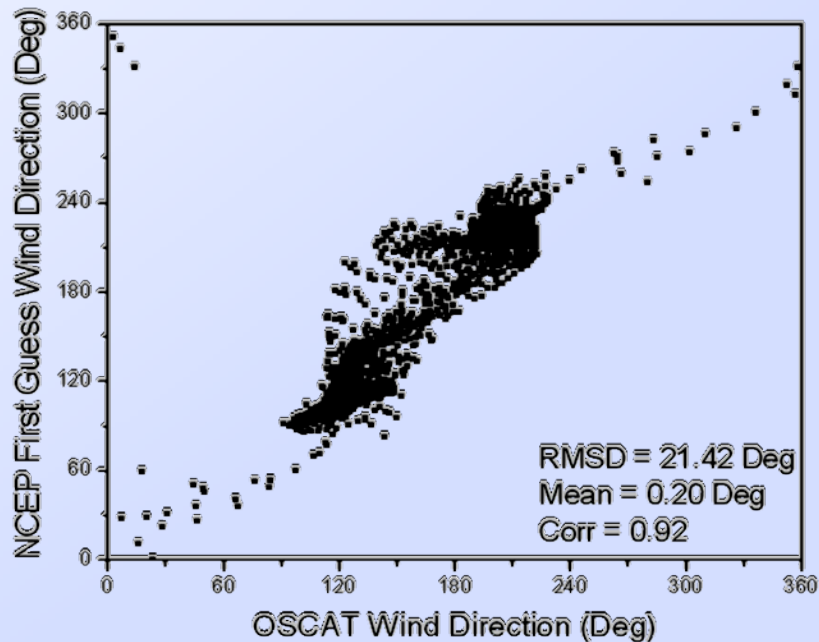
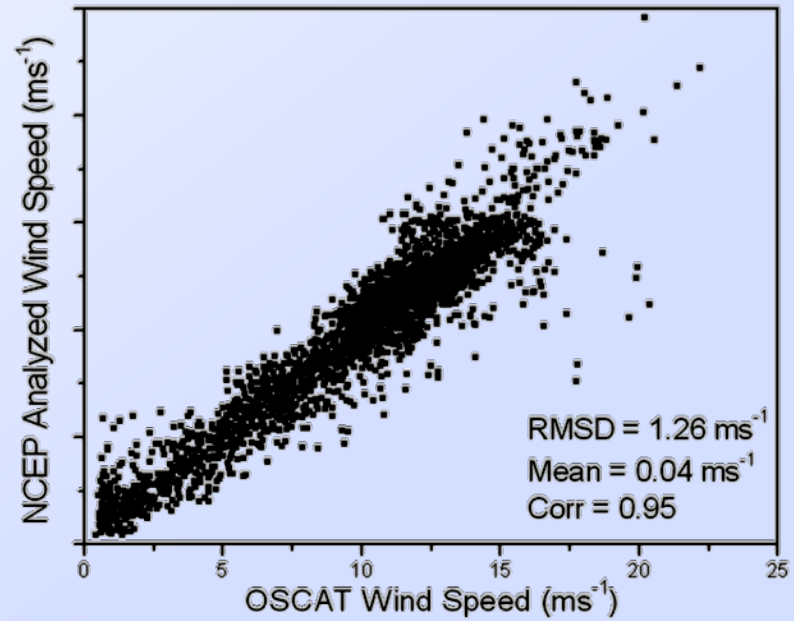
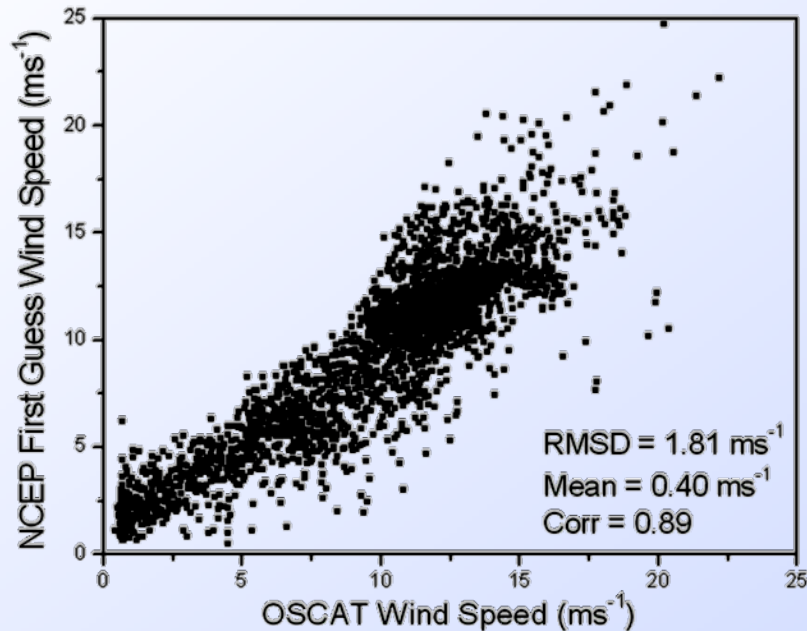


First Guess and Analysis Departure of Wind Speed and Direction

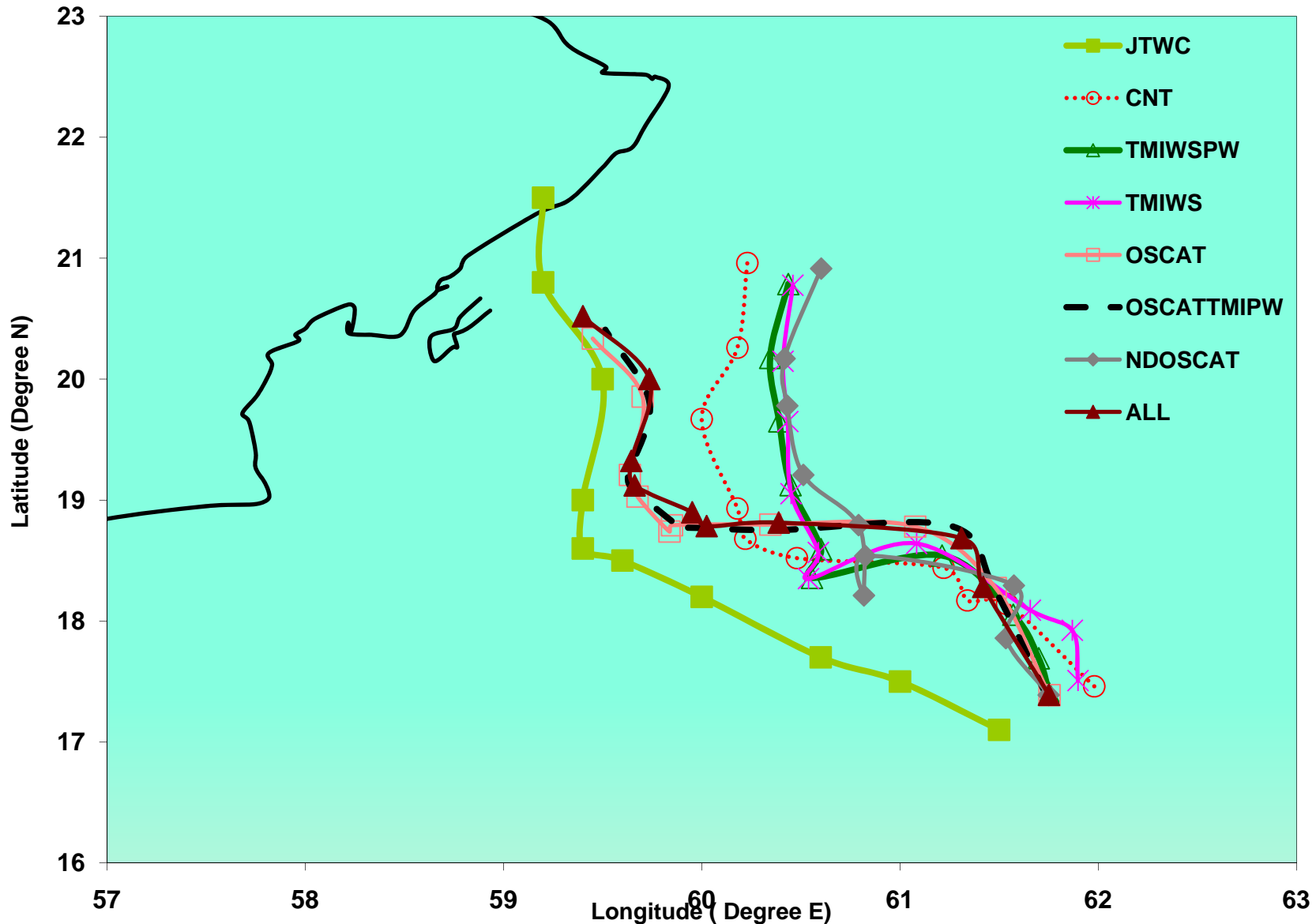




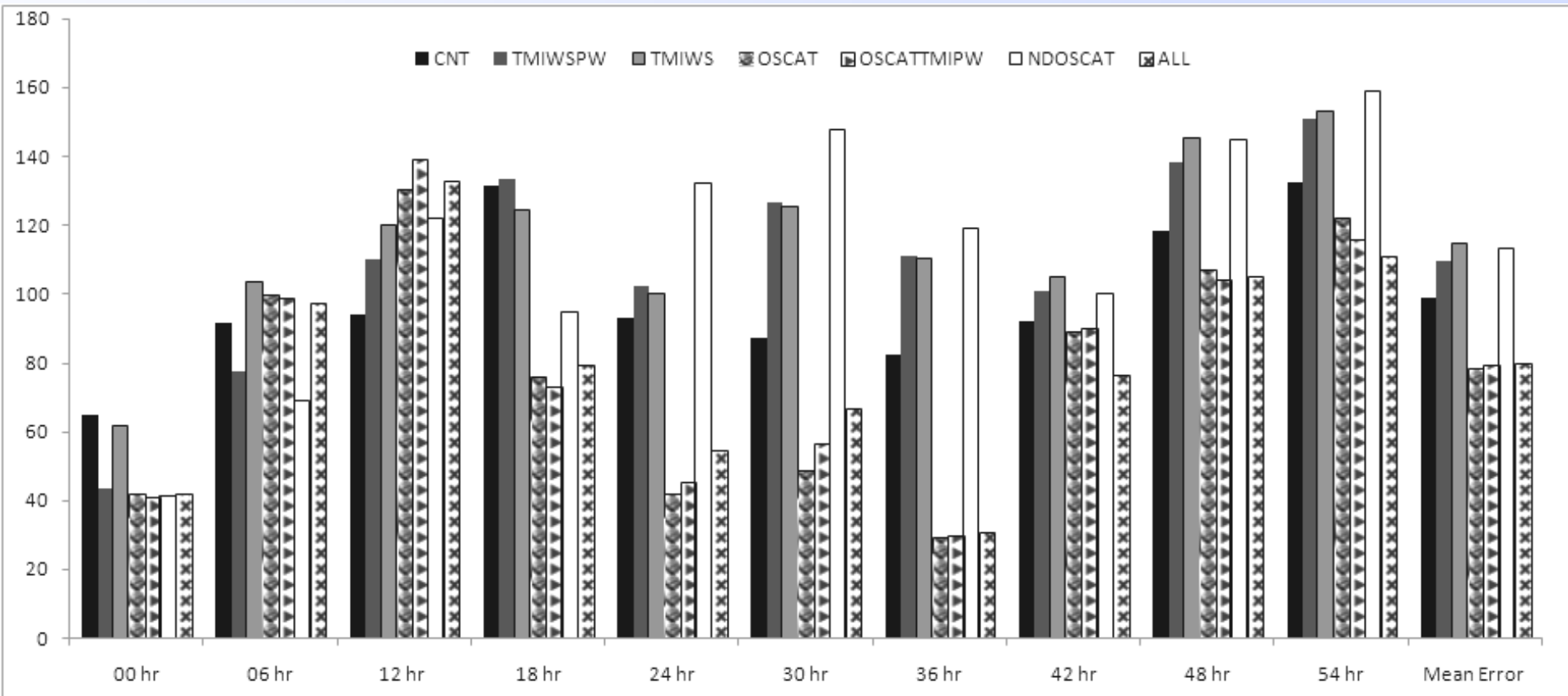
First Guess and Analysis Departure of Wind Speed and Direction



Track of the storm center for the 54-h period starting from 18 UTC of 01 June 2010 and ending at 0000 UTC of 04 June 2010



Six hourly Track errors in the simulated cyclone track (km)





Conclusion

- Scatterometer observations improved the initial position of the center of the cyclone.
- TMI based experiment intensified the initial minimum SLP whereas, OSCAT based experiments predicted very nicely the initial SLP.
- Except the OSCAT based experiment none of the experiment was able to predict the track of cyclone towards the Oman coast.

Motivation from Monsoon School

Kalman Filter in WRF Model

- *Randhir Singh*, Prashant Kumar & P. K. Pal: Assimilation of Oceansat-2 Scatterometer Derived Surface Winds in the Weather Research and Forecasting Model. (Accepted in IEEE Transactions on Geoscience and Remote Sensing).*
- *KP Harish Kumar, Prashant Kumar* and P. K. Pal: Impact of Oceansat-II Scatterometer Winds and TMI Observations on PHET Cyclone Simulation. (Submitted in IEEE TGRS).*