

Interactive comment on “Cyclonic intensity study using sea level pressure estimations from Oceansat-II scatterometer winds over Bay of Bengal during 2013” by C. Purna Chand et al.

Anonymous Referee #2

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Paper: Cyclonic intensity study using sea level pressure estimations from Oceansat-II scatterometer winds over Bay of Bengal during 2013 Author: C. Purna Chand, M. Venkateswara Rao, K. V. S. R. Prasad, and K. H. Rao

Summary: This paper uses a PBL model from the University of Washington with Oceansat-II scatterometer winds as an input to derive a surface pressure field for three tropical cyclones in the Bay of Bengal during 2013.

General comments: The approach here is flawed in that the sensor being used (Oceansat-II) is incapable of resolving the winds in the core of most tropical cyclones and thus any attempt at retrieving the pressure field will result in severe under-

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estimation of both the MSLP and the tight pressure gradients without substantial pre-processing of the data. The authors note these deficiencies but I believe that additional work needs to be done to address the shortcomings of the approach. There a number of grammatical errors that I noted that should be corrected if the paper is re-submitted. Is it Oceansat or OceanSat?

Abstract: "Pressure drop as per IMD reports were observed to be higher than model..." Much higher in the cases of both Phailin (> 50 hPa!) and Lehar (> 20 hPa).

"However, the model retrieved pressure fields compare well against buoy measurements" This implies that buoy observations are acting as ground truth including the TC inner core region and thus the model does well. This is very misleading. The authors do not note where the buoys are located relative to the TC center. Looking over figure 5 it looks like none of these observations are near the TC inner core?

Paper Body: Pages 2 section 5 - "Identified more low pressure ..." (grammar)

Page 2 section 10 - "4 dyas life span" - (spelling)

Page 2 section 30 - "OSCAT winds compare favorably against ECMWF and NCEP". Comparing "observations" to model fields notwithstanding there is plenty of literature that looks at the particular challenges of using scatterometer winds in tropical cyclones. The authors may be able to use the approach of Stiles et al (2014) to improve the quality of the OSCAT data in order to retrieve winds > 25 m/s. See:

Stiles, B. W., R. E. Danielson, W. L. Poulsen, M. J. Brennan, S. Hristova-Veleva, T. P. Shen, and A. G. Fore, 2014: Optimized tropical cyclone winds from QuikSCAT: A neural network approach. IEEE Trans. Geosci. Remote Sens., 52, 7418–7434.

Page 3 section 5: "Phailin cyclone ... eye pressure less than 1000 hPa". It is confusing in this discussion of the intensity whether the authors are referring to IMD pressures or the model pressures?

Page 3 section 5: No discussion here regarding the asymmetries in the pressure fields

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in Figure 2? Is this an issue with processing of the ambiguities?

Page 3 section 15: "Buoy measurements compare favorably to model estimates". This is misleading as it suggests that while IMD estimates are a poor match to the model in-situ buoy observations verify the model is skillful. There is no discussion here to note that the buoys are not located near the TC center. Plots showing the buoy locations relative to the TC at the time of the OSCAT pass would clarify this.

The plots in figure 3 clearly show the under-estimation of pressure of the model compared to the IMD estimates. So it is not clear to me how this model would be applied? Certainly it would not be used to estimate intensity?

Figures 5 and table 1: Again it needs to be made clear what exactly is being compared here lest the readers come away with conclusion that the model can accurately estimate the MSLP of even the most intense TCs.

Summary: I appreciate what the authors are attempting to do here. Estimating TC intensity in the absence of observational data such as aircraft reconnaissance is a challenge. However OSCAT (and other scatterometers) can at best only be used to estimate the intensity in weaker storms with an inner core that has sufficient diameter to be resolved by the instrument or wind structure information such as the radius of gales. Additional skill may be obtained using the neural network approach of Stiles but if must be developed specifically for OSCAT (though QSCAT is very similar so it should work).

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