

## ***Interactive comment on “Maximum wind radius estimated by the 50 kt radius: improvement of storm surge forecasting over the Western North Pacific” by H. Takagi and W. Wu***

### **Anonymous Referee #1**

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#### General comments

This paper shows an interesting new result that provides the potential for real-time analysis of the radius of maximum winds ( $R_{max}$ ) of tropical cyclones. This method appears to perform better than some other methods previously published in the literature. I have a couple of comments, though.

#### Major comments

1. The method for the estimation of the radius of maximum winds depends on an estimation of  $R_{50}$ , the radius of 50 knot winds. Once this is known, the authors have shown that the resulting estimate of  $R_{max}$  is reasonably accurate. The reader immedi-

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ately asks how easy it is to obtain the estimate of  $R_{50}$ , and how actually this estimate is done scientifically. In the data that is analyzed in this study, is  $R_{50}$  obtained from the station data? Or from a forecast? This is not explained and needs to be, because then the reader will understand how forecasters might actually use this method in real time. On P. 6441, the authors say that  $R_{50}$  is easily obtained, but don't say how forecasters estimate this, nor how accurate are these estimates in real time.

#### Minor comments.

P. 6435, line 14. The focus on very intense tropical cyclones is understandable, since these are the ones causing the strongest storm surge, but more justification is needed of the specific central pressure threshold used here. Why 935 hPa specifically?

P. 6437, use of the Myers formula for pressure change from the center: there are other, more up-to-date methods for specifying the pressure and resulting wind field that might also give an improvement in the simulation of storm surge. This should at least be noted in the discussion section, with a few appropriate references.

Figure 8. The real test of whether the new formulation of  $R_{max}$  improves storm surge modeling is how the model performs for more than one tropical cyclone using the new  $R_{max}$  estimate. The authors should note that more cases should be simulated to test this.

#### Technical corrections

P. 6432, line 11 and elsewhere: “casualties” means “dead and wounded”. I think the authors mean “fatalities” here.

P. 6436, line 2: should be “of the time”.

P. 6440, line 1 and elsewhere: “The Haiyan” should be “Typhoon Haiyan”.

P. 6441. Line 22: “remarkable” should be “noticeable”.

P. 6442, line 25. Should be “existing methods”

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P. 6443, line 1. Should be “Although this new method was expected. . .”

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