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## ***Interactive comment on “Borneo vortex and meso-scale convective rainfall” by S. Koseki et al.***

**Anonymous Referee #1**

Received and published: 8 October 2013

**Overview** This paper analyzes features of the Borneo vortex under conditions of cold winter wind surges. There are a number of errors both scientific and in the writing, and the paper should have been checked more carefully before submittal to peer review. The vorticity analysis adds nicely to the current understanding of the Borneo vortex. Overall I suggest major revisions and a thorough checking over before an updated manuscript is re-submitted.

### Specific comments

85 L11: Change in direction begins north of Eq., how have you concluded that the change in direction occurs because of Coriolis?

85 L 24: Explain why you are investigating isobaric divergence of absolute vorticity flux.

85: Section 3.2 is confusing and there is speculation rather than results being shown

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86 L2: Fig 2c is a difference plot so does not show this.

86 L3: What convergence is being talked about here? This statement needs more explanation. Why does the enhanced vorticity transport lead to convergence? Could anything else be causing this convergence. Have you proven that this is the reason for this convergence?

86 L5 – 10: It is not explained why these features are important nor how they favour the generation of the Borneo Vortex.

86 L12: Why not just look at divergence of water vapour? Should explain why variables are used, what is the physical relevance.

L15: Intensification? What is intensifying? Similar to what?

L15: Unclear and grammar incorrect.

L21: moist static energy increases not shown.

L26: “rainfall is dominant” ? bad wording. Also Fig shows anomalies not total rainfall so cannot ascertain totals. Unscientific statement and does not even mention that this is SS case only. Serious error!

P87 L2: Cannot conclude this evaporation not shown, surely evaporation is important for rainfall in this region.

L17: Convergence not shown, more of a discussion of previous research in this section and speculation.

L21: Fig 2 c indicates enhanced westerlies, not really northerlies, in the sea north of Java. This statement is scientifically incorrect and the use of the results here to support the previous mechanism is dubious. generally weak or wrong argument in this section. More careful explanation and reasoning required.

L26: The enhanced rainfall does not line up well with the AVFC.

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Interactive  
Comment

P88 L22: Since the analysis box chosen is close to the equator this area will be unfavourable for TCs, The Figure 7 a does not provide any validation to the statement written here since the whole area is unfavourable. The MBV only considers 0 to 4 degrees north.

P89 L 2: not the best description of regions, strongest convergence is just north of centre (?)

P89 L20: Why not use the composite of the 55 cases that formed a Boneo Vortex rather than the composite of all SS events. The argument here is a little weak.

P90 L14: When talking about wind better to talk about northerlies, southerlies etc.

L20: Inaccurate, many tropical cyclones are smaller than the scale of this vortex. Fig 10 referred to before Fig 9 L24: ? More explanation needed, I think refers to wrong figure.

L 27 bad wording, the cyclone “saturates”

P91 L15: Best not to say this since a Typhoon has formed in this location.

L24 southern patch in TRMM not model, more careful explanation needed. What are “patchy” clouds?

P91 L10: winds are also strongest in the lower troposphere in a TC.

P92L26: not proven here

P93 L14: Warm air in the mid troposphere tends to reduce buoyancy not increase it.

P94 L10: the co-moving what?

P97 L9 “and but”

P98 L28: Not sure of the argument here.

P99 L4: Some explanation of the relevance of these particular variables should be pre-

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Comment

sented. What is the significance of higher LNB etc. CAPE LNB and LCL do not “work together” they all simply changed because the near surface conditions are changed.

L12: not really, need trigger to make rain, can have high CAPE with no rain, in this case the front provides the trigger.

Figure 1 is a strange plot because it is just Decembers but appears to link them up in one continuous line.

Figure 2: The caption does not make sense, change first sentence in particular. Put in order a,b,c,d

Figure 4: it is not clear over all regions which side of the white contour is above 90%, anomalies from what? White horizontal lines do not line up with latitudes.

Fig 5. Box should be plotted on at least one map to show region of averages.

Fig 8: Caption does not explain the figure properly, no height or explanation of vectors.

Fig10: there are horizontal lines on the plot and others, some formatting needed or may be other issue.

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Interactive comment on *Atmos. Chem. Phys. Discuss.*, 13, 21079, 2013.

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