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## ***Interactive comment on “Multi-scale meteorological conceptual model of observed active fire hotspot activity and smoke optical depth in the Maritime Continent” by J. S. Reid et al.***

### **Anonymous Referee #1**

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Multi-scale meteorological conceptual model of observed active fire hotspot activity and smoke optical depth in the Maritime Continent, Reid et al., 2011

### General Comments

Reid et al. examines the role of atmospheric variability at a variety of time scales in modulating the biomass burning and smoke transport in the Maritime Continent region. Atmospheric variability associated with ENSO, El Nino Modoki, ITCZ migration, Indian Ocean Dipole, Madden-Julian oscillation, tropical waves, tropical cyclone activity and diurnal convection are addressed. Similar to other studies, ENSO phase is found to be a strong indicator of burning and MJO modulates within burning season variability. The

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role of variability in observability and potential prognostic capabilities evolving from the analysis are also discussed. This manuscript presents new information that will advance our understanding regarding the role of atmospheric variability in modulating burning activity in the Maritime continent. However, the manuscript is too wordy and needs to be substantially shortened.

## Specific Comments

1. Covariation of observability with modes of atmospheric variability is an important consideration in interpretation of results presented in this manuscript. In this context, quantification of observability (cloud cover/combination of cloud cover and optical depth?) could enhance the analysis presented. For example, such quantification could be utilized to account how much of the variability in observed fire counts between the differing phases of ENSO is caused by differences in observability.
2. Does modulation of surface vegetation growth by antecedent precipitation, in the period prior to burning season, have an impact on fire counts? This might be another factor to consider.
3. On page 21134, lines 20-27 make several observations related to Kelvin, Rossby and Easterly waves. However, the results Section 7 refer to Table 2, but not to any of the figures used in the analysis. Thus it is know clear how the analysis conducted led to conclusions on page 21134.

## Minor Comments

1. Page, 21094, Line 28: “. . .top of atmosphere and surface forcing up to -50 and -200 Wm-2”. Instantaneous values?
2. Raheev et al. should be cited as Rajeev et al through out the manuscript.
3. Section 2.2: The description of the precipitation datasets could be substantially reduced.

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4. Page 21125, lines 23-24: Reads awkward, sentence needs to be reworded
5. Page 21130, lines 22-23: “But at broadest scales, fire activity will always be greater in less cloudy conditions”. This statement is unsubstantiated.
6. Section 10.2: Length of this section need to be reduced. For example the last paragraph in this section does not appear to substantially add to the discussion.
7. Conclusion section needs to be more concise

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 21091, 2011.

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