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Interactive comment on “Variation of upper tropospheric clouds and water vapor over the Indian ocean” by R. L. Bhawar et al.

Anonymous Referee #2

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Review of ‘Variation of upper tropospheric clouds and water vapor over the Indian Ocean’, by R. L. Bhawar, J. H. Jiang, and H. Su, submitted to Atmos. Chem. Phys.

This paper is an attempt to relate Microwave Limb Sounder (MLS) observations of upper tropospheric water vapor and ice water content (IWC), and sea surface temperature (SST), to the spatial and temporal behavior of the Indian Ocean dipole observed in SST variability. The manuscript is short and sparse on physical interpretations of the various correlations found between water vapor, IWC, and SST, and are not placed well in the context of previous works. Overall, the manuscript is not organized well and is a difficult read. This is especially true of the abstract. It is very difficult to assess the scientific purpose and salient results from the body of the paper, let alone the abstract. The other impression the reviewer has is that this work could have made an interest-

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ing paper if the authors spent more time being clear in their purpose, complete in the literature review, clear in the methods, results, and conclusions. In its present form, this manuscript is not acceptable for publication in ACP. Perhaps there is an interesting nugget of gold that the reviewer was not able to deduce in this ACPD version.

Some additional concerns include the following.

In Section 3.1, how is the reader supposed to observe the dipole in Fig. 1? The oscillatory ‘behavior’ is hard to observe in the maps, and they do not look consistent (upon visual inspection) between the three quantities (IWC, water vapor and SST), although some of this behavior is implied in the correlations presented in Fig. 4. Does this oscillatory behavior resemble previous works? Why is there no clear periodic oscillation during DJF and MAM? Is this expected or not?

In Section 3.4, top of p. 21775, are all of the correlations (r^2) really that good? For the 100 hPa layer, it looks like there is no correlation between SST and IWC. Perhaps the values need to be plotted on different scales for the different layers?

Lastly, in the Summary Section, the authors present as an afterthought a conceptual diagram of atmospheric connections between the Indian and Pacific Ocean basins that arise out of interactions between the Indian Ocean dipole and the Pacific Ocean ENSO. What is the ‘atmospheric bridge’? What is the diagram supposed to tell the reader? Also, how does one conclude that the dipole and ENSO interact with each other when the EOF analyses are limited to the Indian Ocean only? The reviewer was not able to understand the flow of the scientific logic that led the authors to the schematic of Fig. 5.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 11, 21769, 2011.

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