

## ***Interactive comment on “Convective environment in pre-monsoon and monsoon conditions over the Indian subcontinent: the impact of surface forcing” by Lois Thomas et al.***

### **Anonymous Referee #2**

Received and published: 12 February 2018

This manuscript investigates thermodynamic soundings for premonsoon and monsoon seasons from the Indian subcontinent are analyzed to document differences between convective environments. Pre-monsoon environment features more variability for both near- surface moisture and free-tropospheric temperature and moisture profiles. As a result, level of neutral buoyancy (LNB) and pseudo-adiabatic Convective Available Potential Energy (CAPE) vary more for the pre-monsoon environment. The authors argue that the key element is the partitioning of surface energy flux into its sensible and latent components, that is, the surface Bowen ratio, and the way Bowen ratio affects surface buoyancy flux.

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Overall, the manuscript is well written. It is obviously beneficial to have detailed analyses of observation data on the Indian monsoon. Idealized simulations are well setup. This reviewer, however, feel that the findings from the analyses are plain instead of new insights on the atmospheric physics related to Indian monsoon. For instance, it is very obvious to see that LCL heights are shown to depend on the availability of surface moisture, with low LCLs corresponding to high surface humidity arguably because of the availability of soil moisture.

1) The argument with observations of changes in the Bowen ratio and LCL height around the monsoon onset is clear. But, in other sense, the Bowen ratio is a resulting parameter instead of a controlling variable. The authors need to be careful in describing the analyses.

2) Regarding the soil moisture feedback, there are numerous literature that describes the soil-moisture-precipitation feedback processes (e.g., Asharaf et al. 2012, Soil Moisture–Precipitation Feedback Processes in the Indian Summer Monsoon Season). It is recommended to cite these papers in explaining the physical mechanism, and an addition of a new insight from the previous literature.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-1>, 2018.

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