

## ***Interactive comment on “Aerosol-induced high precipitation events near the Himalayan foothills” by Goutam Choudhury et al.***

**Anonymous Referee #1**

Received and published: 7 July 2020

To the Authors:

The data presented in the paper is precious and work is valuable for other researchers, however, the paper need to be thorough revision by keeping its value for science as well as language. I suggest following points to improve for the revised version of this work:

1. In line 60, you mention “aerosol concentration”. Do you mean “aerosol optical depth”? If yes then please change it accordingly as they both have different meaning.
2. In the second section, you say that the domain selection is based on the work of Bohlinger et al. 2017. However, they have classified three domains in their study. Is there any specific reason of considering only one part of Himalayan foothills? Does the

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AECI mechanism only works in the selected domain and not in other parts? Please explain this in the conclusion section to be clearer.

3. Typo in line 70: change “toMODIS” to “to MODIS”.

4. The information regarding the successful AOD retrieval described in the second section from line 71 to 78 would make more sense in the result section after you describe the AOD composite plot.

5. In Figure-2, why are the color-bar limits different in the plots of AOD and MSE? Please make it same for better comparison.

6. Lines 123 & 124: Does “R” means Pearson’s correlation coefficient? The methodology used in calculating correlation coefficient should be mentioned in the draft.

7. Typo in line 131: it should be BLH instead of PBLH.

8. The third paragraph of result section describes the association of aerosols and CAPE for extreme events. The effect is described; however the causation needs to be elaborated. Following papers can be referred and included in the manuscript.

Wang, Y., Khalizov, A., Levy, M. and Zhang, R., 2013. New Directions: Light absorbing aerosols and their atmospheric impacts. *Atmospheric Environment*, (81), pp.713-715.

Li, Z., Rosenfeld, D. and Fan, J., 2017. Aerosols and their impact on radiation, clouds, precipitation, and severe weather events. In *Oxford Research Encyclopedia of Environmental Science*.

9. The abstract needs modification. Could you please add some quantitative findings (AOD increase and MSE increase percentages) of this study in your abstract?

10. A schematic diagram showing the AECI mechanism over the Himalayan Foothill (similar to Fan et al., 2015) would better convey the message and ease the understanding of literature.

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