Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "Cloud Condensation Nuclei properties of South Asian outflow over the northern Indian Ocean during winter" *by* Vijayakumar S. Nair et al.

Anonymous Referee #2

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Review of "Cloud Condensation Nuclei properties of South Asian outflow over the northern Indian Ocean during winter" by Vijayakumar S Nair et al., (ACP-2019-828)

This paper presents some interesting results on cloud condensation nuclei (CCN) and condensation nuclei (CN) concentrations obtained over north Indian ocean as a part of ICARB-2018 conducted during winter 2018. Sophisticated data collected within the ship cruise campaign (16 Jan. 2018 to 13 Feb.2018) has been wisely used to investigate the latitudinal and longitudinal variations. Major conclusions drawn from this detailed investigations includes findings of high CCN over southeastern Arabian sea compared to equatorial Indian ocean, high CCN efficiency over south Asian outflow

compared to equatorial Indian ocean, contribution of accumulation mode to high activation fraction over north Indian ocean. Further, strong association between CCN efficiency and geometrical mean diameter of aerosol number size distribution is being reported.

In general, paper is concise and well written with substantial new information and apt for Atmospheric Chemistry and Physics Journal. However, few clarifications are required before accepting for its publication. Below are the some of the issues which authors need to take care. Authors are strongly encouraged to revise this manuscript.

Comments/Suggestions:

Page 3, Lines 28-31, Figure 1:

The spatial extend of the aerosol transport to the Indian Ocean is qualitatively depicted by the climatological (2002-2017) mean aerosol optical depth (AOD) derived from MODIS observations over the northern Indian Ocean (contours in Figure 1). These contours are hard to see from the figure. I suggest including color contour of the same.

Page 4, Lines 5-7:

The first phase of the cruise over southeastern Arabian Sea (SEAS) is divided into 'SEAS1' and 'SEAS2' regions where the former is influenced by the air masses from peninsular India, and the latter is from the Bay of Bengal. I wonder how the lines are drawn that differentiates SEAS1 and SEAS1.

Page 4, Lines 11-12:

Indian sub-continent during this period due to the. This is an incomplete sentence.

Page 17, Figure 8:

I am unable to see much difference between Type 3 and Type 4. Did it qualify the followed analysis procedure?

Page 20, Line 3:

Reported 'bi-modal' size distributions should be reported 'bi-model' size distributions.

There are few grammatical mistakes and typos. I suggest authors to go through the manuscript carefully again before submitting revised draft.

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