

Interactive comment on “The remote response of the South Asian Monsoon to reduced dust emissions and Sahara greening during the middle Holocene” by Francesco S. R. Pausata et al.

Anonymous Referee #1

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Reviewer comments#

The manuscript on “The remote response of the South Asian Monsoon to reduced dust emissions and Sahara greening during the middle Holocene” submitted by Francesco et al., attempted to show the link between the South Asian Monsoon system and the associated reduction in airborne dust concentrations related to the Sahara greening. The article is well written. The authors used climate model simulations and analyzed the data. They have carefully explained each figure by considering every minute detail observed in each figure.

Comments 1. Figure caption for figure 4 shows it is surface temperature. But in the

C1

write-up section, it is written as sea surface temperature (SST).

2. Line 145-147 describes the precipitation dipole in the equatorial Indian Ocean. This feature resembles the precipitation pattern observed during the positive phase of the Indian Ocean Dipole (IOD). It will be interesting to explain the precipitation pattern in the context of IOD.

3. Figure 4 represents the surface temperature changes from the Pre-Industrial case. In 4a,c, the equatorial Indian ocean exhibits an IOD-like feature with cooling near the Maritime continent and warming over the western equatorial Indian Ocean. The strength of IOD, expressed in terms of IOD index, is calculated as the difference between the anomalous SST gradient over the western equatorial Indian Ocean (50E-70E and 10S-10N) and the south eastern equatorial Indian Ocean (90E-110E and 10S-0N). Figures 4a & c cooling and warming regions matches with the cooling and warming regions observed during positive IOD. Many studies have shown that many Indian summer monsoon years that accompanied positive IOD were above normal monsoon years). Even figure 4b also shows slight cooling near the Maritime continent compared to fig 4a&c. Hence it will be wise to check how the IOD- like feature might have influenced the Indian summer monsoon precipitation and under what context the IOD-like feature appears in the climate model simulations.

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C2