

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 #2

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Summary

Pausata et al present Earth System model simulations of the mid-Holocene which show that the greening of the Sahara and reduction in Saharan dust loading probably enhanced the South Asian monsoon during this time.

The paper is well written and extremely thorough. This paper is suitable for Climate of the Past and I would recommend publication after minor corrections as listed below.

Comments:

In a few places the reduced radiation flux is mentioned, could you calculate the

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regionally-averaged the short-wave flux and include it in the text?

Lines 72-75: "Another recent study (Thompson et al, 2019) ..."

I'm don't really follow this wording. My impression was that the Thompson et al, paper showed that dust-cloud interactions had the opposite effect compare with dust-radiation interactions for rainfall in North Africa for the MH. Hopcroft & Valdes (2019) showed that dust particles radiative properties are wrong in most models and this leads to a major over-estimation of the dust-radiation effect. Perhaps you can reword this sentence to clarify.

Line 109: I think you should specify which dust optical properties are employed in the model here.

Line 448: Here I think some caveats around dust optical properties and resolved particle sizes and morphologies are needed.

Table 2: I'd be interested what the simulated surface albedo values are over the Sahara here. For example, are there other modelled processes (like wetter soil parameterisations) that could modulate the prescribed values?

Some of the references have incorrect bracketing. e.g. line 56 Pausata et al 2020, line 58, Texier et al 2000 and line 142, Zhao and Harrison. Please could you check these.

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-142>, 2020.

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