

Interactive comment on “The effect of a dynamic background albedo scheme on Sahel/Sahara precipitation during the mid-Holocene” by F. S. E. Vamborg et al.

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Response to Anonymous Referee 2

We would like to thank the referee for his detailed comments on the paper. We changed the manuscript as suggested in comments 1, 2, 3, 5, 6, 8, 10 and 11. For the other comments we made the following changes:

4. “with dynamic vegetation” - This is superfluous and thus deleted.

7. What we wanted to point out here, is that there is a seasonal difference between the forcings in terms of at what time of the year they affect precipitation the most. As one sees in the first two rows of figure 6 (a-f) the increase in rainfall that is due to C1307

the dynamic albedo is either spread across the rain period (mainly 0K) or focussed to the beginning of it (6K only). If one now considers the difference between $6K_{dyn}$ and $0K_{dyn}$, as we do in the last row of figure 6 (j-l), we see that the positive precipitation anomaly tends to get larger/ cover more latitudes towards the end of the rain season. The driving force behind the anomaly in the latter part of the season can thus not be the dynamic albedo, but is likely to arise from the SST and orbital forcing. To clarify our point, we have reformulated the last few lines of this section: In ES and AP there is a tendency towards larger increases at the end of the season. We have shown above, that the dynamic albedo scheme mainly affects rainfall at the beginning of or throughout the rainy season. The large increase at the end of the season that we see here, must thus mainly be due to the orbital and SST forcings.

9. We thank the reviewer for pointing this article out to us. We have added a further sentence on the possible importance of the effect of enhanced recycling and a reference to Carrington et al. (2001).

12. The label now reads 6K-0K, consistent with the legend.

13. We have split Fig. 6 into two separate figures in order to increase the size of the individual plots, as well as increased the line thickness of the grey and black contours. This should solve the problem.

The reviewer also recommended simplifying the presentation as much as possible. We decided to keep all the results that we presented in the discussion paper, but have omitted text in some sections, to reduce the length of the text: In Section 4.2, we omit the first paragraph (page. 2347 lines. 14-23), since this is mainly an introductory text and not necessary for the comprehensibility of the following results. In this section we also remove some superfluous concluding remarks (page. 2349, lines 13-15). For similar reasons we omit most of the first paragraph in Section 5 (page. 2351, lines. 13-14, 16-21.)