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# Interactive comment on "Impact of precession on the climate, vegetation and fire activity in southern Africa during MIS4" *by* M.-N. Woillez et al.

**Anonymous Referee #1**

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Review of Woillez et al.: Impact of precession on the climate vegetation and fire activity in southern africa during MIS4

General comments

The study is well designed, well written and adresses a scientifically interesting topic with nice outcomes. The approach is well evaluation including an evaluation of the downscaling of driving data and the model's present day performance. I therefore have only few comments. The main improvement I can suggest is to include a two additional datasets in the evaluation. Including a tree cover and burned area dataset based on remote sensing could strongly improve and simplify the evaluation for present day. Moreover it could help in the discussion.

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Specific comments

p. 5392, l. 19/20: that fire activity strongly depends on vegetation type is well known. I suggest to be more specific: fire activity in southern Africa during MIS4 is mainly driven by vegetation cover.

p.5395 l.14-17: SPITFIRE does not resolve single fire effents, I am therefore not fully convinced the high resolution is needed, because fires are local scale events, but rather because the environmental conditions (moisture, vegetation type, fuel amount and type) may change. If all the drivers of the model would be spatially homogeneous, the fire patterns would not change with resolution.

Figure 4a: It is a little difficult to compare figure 4a and b. Instead (or in addition) it would be very interesting to see bare soil, trees and grasses from remote sensing data. As there are datasets available on tree cover, there is no need to compare the modelled tree and grass cover to biomes. This is available based on modis data from the Hansen et al. (2003) dataset.

Figure 5: The same figure with the Hansen et al. (2003) dataset would be very useful and interesting.

Figure 6: include a burned area dataset, for instance GFED which is already cited in the text. Although the absolute numbers of burned fraction are quite different, the authors suggest due to the lack of human influence in the model, the geographic patterns and the relation between burned fraction and precipitation should be similar.

Figure 9: The information of figure 9 is already available from Figure 7, I would suggest to remove this figure, as the number of figures in the paper is quite large.

p. 5409 l. 11-17: also here including the tree cover dataset would help the discussion. Higher tree covers in the model may be attributed to anthropogenic influences.

Technical comments

The manuscript contains some typos that should be corrected

References

Hansen, M. C., R. S. DeFries, J. R. G. Townshend, M. Carroll, C. Dimiceli, and R. A. Sohlberg (2003), Global Percent Tree Cover at a Spatial Resolution of 500 Meters: First Results of the MODIS Vegetation Continuous Fields Algorithm, Earth Interactions, 7 (10), 1-15.

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