

## ***Interactive comment on “Increased aridity in southwestern Africa during the last-interglacial warmest periods” by D. H. Urrego et al.***

### **Anonymous Referee #1**

Received and published: 2 September 2013

Urrego and colleagues present an orbital-scaled pollen time series covering the time window between 190 and 25 kyr BP. The down core pollen analysis is accompanied by modern surface samples collected from proximal source. The surface samples provide useful tool for the interpretation of the pollen time series. Urrego and colleagues provide a critical discussion about processes that can bias the interpretation of pollen assemblages and use statistical approach to reduce bias related changes accumulation rate. The findings of this study add to the emerging picture of paleoclimate in southern Africa.

Introduction:

The introduction and setting provides a good coverage of what is known and frame well the questions that are addressed later in the paper. It would be good if the authors

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use more recent papers when they describe the modern atmospheric and oceanic conditions that shape the modern climate in this region. For instance, the Agulhas Leakage and its effect on climate and thermohaline circulation should be described using most recent climate/model papers (for instance: Biastoch 2008, 2009, 2010 and others). It would also be helpful if the authors would briefly explain what does mean “high precipitation seasonality”. Looking at map in Figure 1, it is a little bit strange how the Orange River is shown. Where the large tributaries of the Oranges River? Please add them.

#### Results and Discussion:

I think it would be very helpful to provide separate sections for the results and discussion. I encourage the authors to do this. The discussion should contrast the finding of this study not only with the regional paleoclimate literature but also with records from South America (Wang et al, 2004, Cheng et al 2013, and pollen records if available). In the Abstract, the authors stated that “Increased millennial-scale variability in the vegetation and climate of southern Africa is also suggested for the last 100 ka”. In the main text there is not that much discussion about millennial scale climate changes. Given that the resolution of the record is not strong enough to robustly reveal millennial scale variation, the authors may just focus on the orbital-scale changes. The authors propose a shift in the austral westerlies as possible climate mechanism. I think, it would be very interesting if the authors could show an ssNa-record (sea salt Sodium) (if available) from the Antarctic ice core records along their pollen record. ssNa is interpreted as an indicator of large-scale changes in atmospheric circulation. In this context, the authors may also refer to findings of Weldeab et al. in *Climate of the Past* (“Holocene climate variability in the Winter Rainfall Zone of South Africa”) who also suggest that that mid Holocene aridification in Winter Rainfall Zone may be related to a shift in the austral westerlies.

#### Conclusion

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The conclusion is brief, carefully framed, and appropriate.

Relevant Literatures:

With the exception of Weldeab et al (see above), I believe that they included most of the relevant works from the region.

English: I believe the manuscript would benefit from English editing by a native English speaker.

In Summary: This paper presents an interesting data and findings/interpretation that add and extend available records from this region. After a minor/moderate revision, I recommend this paper for publication in *Climate of the Past*.

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Interactive comment on *Clim. Past Discuss.*, 9, 4323, 2013.

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