

Interactive comment on “Fossil plant stomata indicate decreasing atmospheric CO₂ prior to the Eocene–Oligocene boundary” by M. Steinhorsdottir et al.

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We thank the anonymous reviewer for their positive review, which has helped further improve our manuscript. A few concerns are identified, summarized and replied to below:

Over-reaching in discussion and conclusion regarding the relationship between timing and magnitude of pCO₂ versus global sea surface temperatures.

Both reviewers pointed this out and we agree with their assessment. We have now changed the manuscript significantly to reflect this, including removing estimations of

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timing-discrepancies between pCO₂ and temperatures in the late Eocene, as well as adding substantial amount of discussion regarding the relationship between pCO₂ and temperatures as recorded by proxies. We have also added a new section that tackles Earth Sensitivity and place our results in the ongoing effort to understand it to the discussion (section 4.3.). Please see reply to reviewer 1 for more detail.

Figure 4 layout could be improved.

We prefer to keep the figure the way it is at present, since we find it easy to read and its components are true to their origin. We are willing to change it however should the reviewer and/or editor insist.

Section 1.2. is too long

We have now slightly shortened the section by removing a sentence from the first paragraph, and shortening and consolidating two others. However, from our experience we find it highly useful to include a proper introduction to the stomatal proxy method, which is still not well understood or well known to many paleo-climate scientists. In this study in particular, it is also necessary to introduce the methods used by researchers that have published on stomatal pCO₂ reconstructions from the same time period, area and in one case fossil plant species, in order to justify our decision to employ a separate approach.

Delete last sentence in section 1.1.

We agree that this sentence is superfluous and have deleted it.

Interactive comment on Clim. Past Discuss., 11, 4985, 2015.

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