

***Interactive comment on* “The southern hemisphere at glacial terminations: insights from the Dome C ice core” by R. Röthlisberger et al.**

Anonymous Referee #2

Received and published: 11 August 2008

General comments:

In this well written manuscript an analysis of delta D and soluble impurities from Dome C has been performed to identify pattern and phase-relationships between Antarctic temperature, South American dust and sea ice during the last nine glacial-interglacial transitions. The authors use a regression approach to estimate the timing of each glacial termination by fitting a ramp to the data. Since all proxies are measured at the same core the record offers a very good control on the relative timing between the different parameters.

The authors find that the terminations are characterised by threshold values beyond which a close coupling between Antarctic temperature and South American dust

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Interactive Discussion

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(cooler than ca. 2 deg C below the present day temperature) and sea ice (warmer than ca. 5 deg C below present day temperature) is established. Moreover, the authors show that the rate of temperature changes over glacial terminations is rather similar at all transitions (ca. 2 deg C per 1000 yrs), although differences in the magnitude and duration of change have been detected at different glacial terminations.

These quantitative estimates provide new helpful constraints on our understanding of deglacial climate change, which will be of interest to a wide ranging audience. Therefore I recommend the paper for publication in *Climate of the Past*.

Specific comments:

In addition to the precise comments of Referee #1 I would like to suggest:

1. Discussion section 3.3 - line 22. Please explain and specify which 'internal amplifiers and feedbacks' might govern the rate of deglacial climate change. Furthermore, it would also be nice to mention potential implications of this finding in a mechanistic context.

2. Besides Figure 4, I also recommend to present a larger version of Figure 1.

Interactive comment on *Clim. Past Discuss.*, 4, 761, 2008.

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