

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

R. Röthlisberger et al.

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1. In section 2.1 we referred to change points in accumulation rate as defined in the subsequent section. In order to make this point clear, we changed the wording.
2. Referee 1 pointed to problems regarding Figure 4. In the version I downloaded from Clim. Past Discuss., colours seem to be consistent (green for  $\delta D$  (top graph), blue for  $nssCa$  flux (middle graph) and red for  $ssNa$  flux (bottom graph) in each panel). Increasing the size of individual panels will need to be addressed by the publishing team.
3. Another concern of referee 1 was that we didn't state clearly enough what the reason for the threshold and the low dust levels during mild stages is. As stated in the last paragraph of section 3.1., we suggest that during mild stages the average wind

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velocities were below the entrainment threshold and potentially the entrainment threshold was elevated due to increased soil moisture and vegetation cover. We expanded section 3.1 a little bit, in order to emphasize our hypothesis.

4. We reworded the last sentence in section 3.2 to clarify the statement. The sensitivity of sea salt flux as a proxy for sea ice is reduced during periods of large sea ice extent.

5. We described the rate of change for nssCa and ssNa flux in the main text. In order not to clutter figure 8, we did not add to it. However, we supplied a supplementary figure that shows the rate of change in nssCa flux and ssNa flux in comparison to the rate of change in deltaD and refer to it in the main text.

6. Earlier papers by Röthlisberger et al. and Wolff et al. used the comparison between CO<sub>2</sub> and ssNa flux to infer the potential influence of sea ice coverage on glacial-interglacial CO<sub>2</sub> changes. They concluded that in the early part of the termination (and during the warm events of the glacial period) CO<sub>2</sub> changes were caused by factors other than changes in sea ice coverage because no effect was seen in ssNa flux (assumed to reflect sea ice extent). As we have shown in this manuscript, the absence of a change in ssNa flux during full glacial conditions may not translate into a corresponding lack of change in sea ice extent. Therefore, the ssNa flux does not provide any evidence for or against the conclusions made. We added another paragraph at the end of section 3.2. discussing this in more detail.

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

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