

Interactive comment on “Tropical and mid-latitude forcing of continental Antarctic temperatures” by C. S. M. Turney et al.

Anonymous Referee #2

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The paper describes the use of stable isotope in water to document temperature variations in the mid-troposphere over the SH high-latitudes. This is the first time (as far as I'm aware) that these data have been used for this purpose as opposed to data from numerical model reanalysis. Thus the paper represents a new way of looking at temperature variations in the Antarctic, which has always been an uncertain area. In my opinion the paper should be published pretty much as it stands, with a few minor additions/corrections.

I think the main omission by the authors is some calculations to clarify the capability of delta D in representing the local temperature and circulation variabilities. Most people reading this article will probably be more familiar with the SH climate, and are less likely to be experts in the ice core products (myself included) and so it is important

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that readers are pointed to some source of information about what delta D can tell us. I would be particularly worried about the seasonality of annual resolved delta D in representing the hemispheric circulation change in the SH high latitudes. These worries may be unfounded, but without a source of information about the limitation, I'm left wondering how good these isotope data are representing local climate variability.

There is a strong linear trend in the SLP or Z700 in the SH since 1979 in Era-I and NOAA-20th reanalysis data. It is worth testing whether the results in several figures are sensitive to this long term linear trend in the data.

A caveat ought to be added in the conclusions section that since Fig5 only looks at a simple coherence analysis of two time series there is still a question mark over the statistical significance and physical understanding of the results, and that further studies as new data and modeling become available should help to resolve this issue.

Interactive comment on The Cryosphere Discuss., 9, 4019, 2015.

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