

Interactive comment on “Links between CO₂, glaciation and water flow: reconciling the Cenozoic history of the Antarctic Circumpolar Current” by J.-B. Ladant et al.

Anonymous Referee #2

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This paper reports results from a modeling study that shows continental cooling driven by ice sheet formation increases sea ice formation, thereby strengthening the ACC. The results are set in the context of numerous studies exploring the evolution of glaciation of Antarctica and the development of the ACC.

The paper appears to be basically sound, and the modeling approach seems reasonable. I find the analysis to be rather superficial, and this is a weakness that might preclude publication in its present form. The authors briefly address the role of the meridional density gradient as a dynamical mechanism driving the ACC, though the physics of this are not explored in any meaningful way. There is no explanation of why the ice sheet is related to the sea ice regime. Essentially, the detailed modeling work

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is not supported by adequate analysis.

Minor comments.

pg 2398, ln 7: others → other

pg 2399, ln 16: colder conditions which could [be an alternate mechanism beyond] the decrease in atmospheric...

pg 2401, ln 3: Consistently → Consistent

Interactive comment on Clim. Past Discuss., 10, 2397, 2014.