

Interactive comment on “The global ocean circulation on a retrograde rotating earth” by V. Kamphuis et al.

Anonymous Referee #1

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I started reading this paper thinking that reversing the earth rotation may be the kind of work that someone just had to do at some point whether it was important or not. But, the authors make a very good case that, as they put it, this isn't merely an academic exercise. While the MOC is not sensitive to the sign of the Coriolis parameter, the winds are. As a result, the E-P pattern between the Atlantic and Pacific reverses. This provides an excellent test of the source of the asymmetry in MOC between the Pacific and Atlantic, showing that it's likely not the salt flux alone that's responsible. The authors push for the multiple equilibria alternative and make a good case for it while still presenting sufficient caveats. They also correctly point out that the next phase would need to be testing the role of the ocean geometry.

The authors use the state-of-the-art coupled ocean-atmosphere CCSM3 as well as an

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ocean model that allows a more detailed bifurcation analysis. The bottom line is that the problem is interesting and the paper is well written. I recommend publication pretty much as is.

Some minor suggestions:

P 2457: I wouldn't call this a "circular argument", but merely a positive feedback.

May want to mention the meridional extent of the Pacific vs Atlantic as a specific geometric factor that can lead to the asymmetry

Labeling of Fig 8 y-axis is confusing: I initially thought this was meant to be the ratio between the two MOCs. Perhaps separate them by comma rather than "/".

Interactive comment on Clim. Past Discuss., 6, 2455, 2010.

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