

***Interactive comment on “Enhanced Atlantic subpolar gyre variability through baroclinic threshold in a Coarse Resolution Model” by M. Mengel et al.***

**Anonymous Referee #2**

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General Comments

This is an interesting paper, which explains with simplified model experiments the importance of buoyancy fluxes for explaining the Subpolar Gyre (SPG) variability. In the face of a freshwater threshold, the amplitude of variability is highly increased. It relies on similar mechanisms previously published by the authors (e.g., Levermann and Born, 2007; Born and Levermann, 2010) to explain that the SPG variability in terms of temperature and salinity advection northward.

The paper would benefit from some better explanation of the model biases and simulations, internal ocean mechanisms involved in the SPG (c.f., Rossby waves, ice

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feedback) and comparison with other mechanisms.

Please also note the supplement to this comment:

<http://www.earth-syst-dynam-discuss.net/3/C195/2012/esdd-3-C195-2012-supplement.pdf>

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Interactive comment on Earth Syst. Dynam. Discuss., 3, 259, 2012.