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Interactive Comment

Interactive comment on "Development of Global Sea Ice 6.0 CICE configuration for the Met Office Global Coupled Model" *by* J. G. L. Rae et al.

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This manuscript describes an update to the Met Office Global Coupled Model. The CICE model itself remains the same, but some of the internal parameters have changed. These do have the desirable effect of improving the Arctic Sea Ice simulation, but overall the Antarctic sea ice simulation is substantially degraded. While I agree that this is due to the change in the ocean model resolution, I believe that the experiments described here are fundamentally flawed and not worthy of publication at this point.

My main issue is that the nominal resolution of 0.25 degrees is not eddy-resolving as the authors suggest. A recent paper by Griffies et al. 2015 clearly outlines that a resolution of 0.25-degrees with no Gent-McWilliams or similar eddy parameterization

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leads to a substantially larger drift in the global ocean temperature (see their Figure 2). The results at 0.1-degree are closer overall in these metrics when compared to a 1-degree ocean simulation with GM. New simulations should be performed either at 0.25 degrees with a GM-like parameterization or at 0.1-degree to begin to assess the changes in the CICE model parameters.

Also, the changes to the CICE parameters should be systematically evaluated to determine which of these has the largest effect in improving the Arctic sea ice. Also, once the ocean simulation has been improved, a similar analysis of the impacts of these on the Antarctic sea ice is needed.

Stephen M. Griffies, Michael Winton, Whit G. Anderson, Rusty Benson, Thomas L. Delworth, Carolina O. Dufour, John P. Dunne, Paul Goddard, Adele K. Morrison, Anthony Rosati, Andrew T. Wittenberg, Jianjun Yin, and Rong Zhang, 2015: Impacts on Ocean Heat from Transient Mesoscale Eddies in a Hierarchy of Climate Models. J. Climate, 28, 952–977. doi: http://dx.doi.org/10.1175/JCLI-D-14-00353.1

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