

Interactive comment on “A near-global eddy-resolving OGCM for climate studies” by X. Zhang et al.

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Received and published: 10 April 2016

The manuscript by X. Zhang et al. presented very comprehensive diagnosis from a high resolution OGCM forced by JRA55 reanalysis, which provided very helpful information for many researchers on modeling, climate change etc. Therefore, it is suitable for GMD journal, and I would like to recommend it to publish. Here are some detailed comments as follows.

1. The mechanism of 1998-2004 Hiatus remains unclear, the numerical experiments in this manuscript provide an important opportunity to understand the Hiatus. For example, how does the model reproduce the basic characteristics of Hiatus such as temperature anomalies in the surface, subsurface and deep ocean, and is there any relationship between hiatus and AMOC? 2. As you mentioned in page 4, bulk formula as

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suggested by Large and Yeager(2004) are applied to calculate the turbulent heat flux and moment flux at the sea surface? However, I am very curious that you have to apply for a large heat correction more $16\text{W}/(\text{m}^2\cdot\text{m})$. Is it resulted from overestimated downward radiation flux in JRA55? 3. Because of large heat flux correction, I suggested that the authors had better show comparison of zonal mean shortwave and longwave radiation from JRA-55, OAFLUX or other available observation. 4. How is the temperature change defined in the Figure 4 ? Is it defined as difference in temperature between the last day and the first day for a given model year? 5. Figure 7, there are significant warm bias at high latitudes in the North Atlantic. Is it due to surface boundary condition, lateral restoring boundary condition or something else? 6. The caption in Figure 9 is "Mean Eddy Kinetic Energy ...", is this correct? 7. Figure 10, I suggested that "mean stream function" in the caption should be replaced with "mean barotropic stream function". 8. The authors calculated simulated MKE and EKE using surface currents, but observed MKE and EKE using sea surface height. If both simulated and observed EKE and MKE are estimated from sea surface height, the comparison may be more reasonable.

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-17, 2016.

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