

Interactive comment on “Assessment of sea ice simulations in the CMIP5 Models” by Q. Shu et al.

Anonymous Referee #1

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This manuscript evaluated the sea ice simulations by 49 CMIP5 models over the Arctic and Antarctic for the period of 1979–2005. The authors compared the model simulated sea ice extent (SIE) with that derived from satellite-based observations (NASA algorithm), and sea ice volume (SIV) with output from the Global Ice–Ocean Modeling and Assimilation System (GIOMAS). The assessment was done for both the Arctic and Antarctic region. Annual cycle and linear trend from multi-model ensemble means are compared with the observations. This is a nice summary about the CMIP5 model sea ice simulations, and could have added value to the pile of publications in this research area, especially considering that most of the previously published papers dealt with part of the CMIP5 models due to their publication date. The work in the manuscript is very similar to what Parkinson et al. published in 2006 about CMIP3 models. However only the “multi-model ensemble mean” (MME) were presented in the manuscript. It would be nice to show each individual model’s performance as other peoples do, for

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example, Massonnet et al. (2012), Stroeve et al. (2012), Wang and Overland (2012) and Liu et al. (2013). While most previous studies focused their discussion on SIE simulations, this manuscript also evaluated SIV, which is an importance variable to be considered. This is an very important addition.

In the introduction the authors state “assessment of the performance of CMIP5 model outputs is necessary for scientists to decide which model outputs to use in their research”. Yet throughout the text we could not tell which model(s) perform better in their standard since only the MMEs were presented. We should NOT compare the MME with observation as observation represents only ONE-single realization.

In Table 1, CMIP5 simulated errors and trends are listed for each individual model. What are these RMS errors and linear trend? Annual mean? Seasonal mean? or what? It is unclear from the text. In Stroeve et al. paper, 20 CMIP5 models’ trends were presented already. How does your result compare with their result?

Comparing CMIP5 model simulated SIV with output from GIOMAS is fine since we do not have systematic pan-Arctic observed ice thickness yet. But pleas do remember that those are model simulations, and therefore it is not true “observation”.

Interactive comment on The Cryosphere Discuss., 8, 3413, 2014.

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