

Interactive comment on “The role of subpolar deep water formation and Nordic Seas overflows in simulated multidecadal variability of the Atlantic overturning” by K. Lohmann et al.

Anonymous Referee #1

Received and published: 5 December 2013

Review's comments for the paper (os-2013-54) "The role of subpolar deep water formation and Nordic Seas overflows in simulated multidecadal variability of the Atlantic overturning" submitted to Ocean Science

Recommendation: a minor revision.

Major comments The change of the Atlantic Meridional Overturning Circulation (AMOC) and its impacts on global climate has received much attention in the recent decades. This paper investigate the role of variations in subpolar deep water formation and Nordic Seas overflows for the decadal to multidecadal variability of the Atlantic meridional overturning circulation (AMOC) with additional sensitivity studies. The major

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conclusion is that the influence of variations in subpolar deep water (SDW) formation is, on multi model average, larger than that of variations in the Denmark Strait overflow (DSO). At 30oN, variation in SDW formation and DSO explain about half and one third respectively of the decadal to multidecadal AMOC variance. Results are interesting and the paper is in general well written. One major concern that the reviewer has is that SDW formation and Nordic Seas overflows are not completely independent as authors acknowledge. Because of this, reviewer likes authors to make some comments on how this would affect their conclusions on relative roles of the variation in SDW formation and Nordic Seas overflows in AMOC variability. The paper, therefore, needs a minor revision by addressing the major comment and the following minor comments.

Minor Comments 1. Line 2 on page 1. Add “circulation” after “overturning” 2. The results from the two sensitivity experiments are important and the main outcomes from them shall be better summarized in the abstract. 3. Table 1. Atmosphere grid for HadCM3 is in “3.75 (lon) x 2.5 (lat)” rather than “3.25 (lon) x 2.5 (lat)”

Interactive comment on Ocean Sci. Discuss., 10, 1895, 2013.

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