

Interactive comment on “High resolution modelling of the North Icelandic Irminger Current(NIIC)” by K. Logemann and I. H. Harms

Anonymous Referee #3

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General: The northward inflow of Atlantic Water through Denmark Strait is simulated with a numerical model of the North Atlantic and the Arctic Ocean with a grid refinement technique around Iceland where a horizontal resolution of 1km and a vertical resolution of 10m is achieved.

The paper is thoroughly written and timely. It surely merits publication in Ocean Science Discussions after minor revision (though I mentioned to major points below).

Major points:

- (i) page 5, third abstract: Salinity and temperature is restored with a time scale of 30 days to the PHC climatology. It is not explained why this relatively short restoring time scale is necessary. Also for state-of-the-art model temperature

restoring is unusual. Please clarify (is there a connection to the grid refinement technique)! In connection with the discussion in 3.3.1 (proportion of variance of the total heat flux represented by volume flux variance versus temperature variance) the restoring time scale seems to be very important.

- (ii) Figure 17: I'm confused with the cross spectra. It is stated that the ordinary correlation between the northward component of the wind stress and the volume flux amounts to 0.86. However the coherency shown in the cross spectra is always much lower but one should get 0.86 if integrating over the frequency (or is the coherency not normalized). I have the suspicion that the maximum at 24 and 29 days is noise which used be tested. Also it is advisable to subtract the seasonal cycle prior to both analyses in Fig 17.

Minor points:

- (i) page 1, third paragraph: "Volume and heat transport ... north of Denmark Strait". I would associate "North of Denmark Strait" with the wind field over Greenland which is surely not meant. Please clarify.
- (ii) page 2, first sentence: "... lowest transport is observed in winter." I would suggest to use the word "observed" only with respect to observations, not model results. (Which I suppose is meant here – otherwise I'm confused.
- (iii) page 5, third paragraph: There is now a more appropriate citation of Roeske: Röske, F., A global heat and fresh water forcing dataset for ocean models, Ocean Modelling, 11, 235-297, 2006.
- (iv) page 5, third paragraph: PHC consists south of about 60N solely of data from the "World Ocean Atlas".

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- (v) page 8, 3.3.1, second sentence, “Daily mean values and corresponding deviations **for** at these sections ...”. Skip “for”
- (vi) page 8, 3.3.1, end of first paragraph. It would help the reader if add “Hornbanki” => “At section 7 (Hornbanki), the model ...
- (vii) page 12, 4. Discussion, first sentence: “ The spatial variability ... by a break down and recover ...”. I think this sentence is not appropriate. There is no break down of the spatial variability but only a reduction. I would avoid the word “break down” and suggest to reformulate the sentence.

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