

## ***Interactive comment on “Stability and forcing of the Iceland-Faroe inflow of water, heat, and salt to the Arctic” by B. Hansen et al.***

**Anonymous Referee #2**

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Review of Stability and forcing of the Iceland-Faroe inflow of water, heat, and salt to the Arctic, B. Hansen et al., Ocean Science manuscript os-2010-31.

I find this paper to represent a significant contribution to our understanding of World Ocean circulation. I will support its publication but with suggestions for minor revision:

- 1) In eqn 1, is the inclusion of  $p_1$  and  $p_2$  redundant (doesn't  $\rho \cdot g \cdot z_1$  already represent  $p_1$  and the potential energy at location 1; same with  $\rho \cdot g \cdot z_2$  for  $p_2$ )?
- 2) p 1263 lines 11-13: "Temperature and salinity increased during the period but variability in the volume transport precludes determination of any significant trends in heat- or salt transports". There is a clear overall trend over the decade towards elevated delivery of both heat and salt across the Ridge, isn't there?

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- 3) In the Conclusion you write that "We conclude that the relative stability of the IF-inflow derives from the processes that generate outflow from the Nordic Seas, especially the thermohaline processes that generate overflow". This is a succinct and powerful conclusion. It should be incorporated more clearly in the Abstract.

Here is a listing of even more minor comments:

- a) p 1247 line 8: By its transport -> Through its transport or With its transport
- b) p 1248 line 18: which most of it -> most of which
- c) p 1248 line 20: but since then, this has been NG. -> when NG was placed further north.
- d) p 1249 line 10: measurements, alone -> measurements alone,
- e) p 1250 line 23: on the average -> on average
- f) p 1252 line 10: For a non-closed system... You may want to refer here to a discussion of budgets in non-closed systems: Problems with estimation and interpretation of oceanic heat transport - conceptual remarks for the case of Fram Strait in the Arctic Ocean, Schauer and Beszczynska-Möller, Ocean Science 2009, doi 10.5194/os-5-487-2009.
- g) p 1253 line 2: surface-near -> near-surface
- h) Eqn 2: has the parameter B been introduced (I see that it is in the appendix, but perhaps not in the main text)?
- i) p 1255 line 11: mainly easterly. Probably better to describe as "eastward" rather than "easterly", since an easterly wind is a westward-blowing wind.
- j) p 1255 line 19: leads with a month -> leads by a month
- k) p 1256 line 17: value for of... is an alpha missing here?
- l) p 1257 line 10: 30 h -> 30 hours

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m) p 1258 line 14: to apply and it implies -> to apply, implying

n) p 1264 line 18:  $1/2 B \cdot D$  ->  $1m/2 B \cdot D$  (and please review and correct any other equations where dimensional units may be incomplete).

o) Table 1: should the reference be to Eq. 2 rather than Eq. 1?

p) fig 9: North, East -> Northward, Eastward

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Interactive comment on Ocean Sci. Discuss., 7, 1245, 2010.