

## ***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?

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

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.

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