

## ***Interactive comment on “Descent and mixing of the overflow plume from Storfjord in Svalbard: an idealized numerical model study” by I. Fer and B. Ådlandsvik***

### **Anonymous Referee #1**

Received and published: 11 March 2008

This manuscript provides an enlightening view of the processes and dynamics at work in the Storfjord region. It describes the output from the numerical model and links it very convincingly with the observations as reported in the literature. Consequently it is a timely contribution to the scientific output from this area in that it is synthesising a lot of the previous descriptive oceanography.

Overall the manuscript is very well presented and written. There is great clarity in the interpretations and the figures are of high quality.

I offer just a few minor comments that I hope will go some way to improving what is already an excellent manuscript.

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P860–01: Can you consider if it would be constructive adding the boundaries for Jan–March and April–June described in the text. It may be that Fig 1 then becomes too complex.

P866 line 27–28: Is this the difference in model stratification a consequence of how the hydrography was constructed \* i.e. related to the profiles in Figure 2??

P867 line 24. I note that sometimes you use  $TR=5\%$  and sometimes  $TR=0.05$  \* can you check consistency throughout.

P868 lines 9–15. I feel that there is a lot of detail in Fig 10 that you cover very quickly in these sentences. There is some interesting hydrographical discussion to have here, please consider expanding this section.

P869 line 1:  $i$  runs from 0 to 2. But it runs from 1 to 3 in the caption in Figure 11.

P871 line 1–4: I think that you should try and rationalise these differences in plume thickness little more, particularly against the observations of Quadfasel et al. This is a large discrepancy. Variability in the overflow or limitations of the model??

Fig 2: Consider putting in two horizontal lines to indicate the depths ranges used in the formulation of the ambient hydrography.

Fig 3. It is not so easy to relate the location of Figure 3 to the regional map of Figure 1. Is there any way you can help the reader here?

Fig 10. I'm not clear what the gray data points are. At  $t=0$ , when there isn't a plume, I am interpreting these as the  $T-S$  property at the appropriate depth of the core along the plume path as specified by the initial profiles in Figure 2. Can you clarify this aspect of the figure and caption. Would it also help to add the white bullets with the same distance along the path as you do for  $t=150d$ ??

Fig 12 (c): The line indicating  $G$  is very thin and faint.

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Textual corrections:

P857, line 16: \*an inclined boundary HAVE been \*

P865, line 27. Can "Farther above the bottom" be replaced with "At shallower depths"??

P870 line 1: I don't think "diagnosed" is the correct word here. Probably "calculated" or even "used".

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Interactive comment on Ocean Sci. Discuss., 4, 855, 2007.

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