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Ocean Science Discussions

Interactive comment on "Internal hydraulic control in the Little Belt, Denmark. Observations of flow configurations and water mass formation." *by* Morten Holtegaard Nielsen et al.

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COMMENTS FROM REFEREE: This paper on internal hydraulic control in the Little Belt by Nielsen et al. is of consider-able interest. The introduction comprises an overview of the present state of multi-layer hydraulics and sections 2 and 3 (physical setting, methods) provide adequate descrip-tions of the location and fieldwork. My main comments pertain to section 4 dealing with the observations and discussion. First some minor points: line 179: generally the expression used is "back and forth", but the authors may possi-bly have sopme ingeious reason for reversing the standard order. AUTHORS' RESPONSE AND CHANGES IN MANUSCRIPT: We have no particular

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reason for using this order. If “back and forth” is avoiding confusion then we shall modify the text.

COMMENTS FROM REFEREE: line 181: pycnocline (singular) is located AUTHORS’ RESPONSE AND CHANGES IN MANUSCRIPT: We will fix the typo.

COMMENTS FROM REFEREE: line 199: for heightened clarity write ... the upper and lower water masses of the Kattegat with a density difference... AUTHORS’ RESPONSE AND CHANGES IN MANUSCRIPT: That is a good suggestion, which we will follow.

COMMENTS FROM REFEREE: These were minor matters but my next comment is more important: line 228: It is stated that the cross-strait density transects showed density variations across the strait, cf. fig. 5. An examination of in particular the right panel of fig 5 reveals a slope of such a magnitude that a geostrophic balance is a distinct possibility, and hence that it is doubtful whether the system can be regarded as nonrotational and farther down the page line 255 et seq. the authors apply Armi’s nonrotating formalism. It is necessary to include a discussion of why rotational effects can be neglected!! AUTHORS’ RESPONSE AND CHANGES IN MANUSCRIPT: Yes, it is true that rotational effects cannot be neglected fully, even if much can be learned based on Armi’s non-rotating formalism. We will modify the text and discuss this.

COMMENTS FROM REFEREE: Sections 5 and 6 (discussion and conclusion) are satisfactory and I particularly appre-ciated that the authors invoked the hydraulic effects on the biogeochemical processes, something I do not think has been done before. A minor point here is that on line 390 ... internal dynamics (plural) are not. . AUTHORS’ RESPONSE AND CHANGES IN MANUSCRIPT: We will fix the typo.

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