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Interactive comment on "Microstructure measurements and estimates of entrainment in the Denmark Strait overflow plume" *by* V. Paka et al.

Anonymous Referee #2

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The paper deals with the gravity currents and the entrainment of ambient water into the Denmark Strait overflow.

This study uses up to date observations from microstructure profiler. The prime interest is on the bottom layer and the interfacial layer. The main novelty is that the lateral stirring due to meso-scale eddies is the main contributor to entrainment and not the diapycnal mixing. This conclusion has been reached based on using a specific measuring system (getting data from the bottom boundary) and profound analysis of data.

The specificity of the study compared to other similar ones in that it addresses the case of very large entrainment rates.

The paper is interesting and presents a valuable contribution to field of ocean entrainment

My major comment is associated with the use of previous theories (see P. 1078, lines 10-15). The differences between the estimates of entrainment rate based on the approaches developed by Arneborg et al. (2007) and Umlauf and Arneborg (2009) are not enough discussed, as this concerns the applicability of these studies to the case addressed in the present paper. I would recommend that the authors also explain in more detail the basics of the theories of Shih et al.(2005) and Osborn (1980) and discuss the results of the present study in the context of limitations of the used theories.

I would suggest also one technical change: Figure 8: Can you plot in this figure also the theoretical curve given by Eq. 10.

Interactive comment on Ocean Sci. Discuss., 10, 1067, 2013.