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Discussions

Interactive comment on "Upper Labrador Sea Water in the Irminger Sea during a weak convection period (2002–2006)" *by* E. Louarn et al.

Anonymous Referee #2

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The manuscript "ULSW during weak convection in 2002–2006" is devoted to an important issue of oceanography of the North Atlantic – formation of the Labrador Sea Water (LSW) and ventilation of the intermediate depths of the ocean. The authors demonstrate a good knowledge of literature and present data collected by their institutes. However, there several reasons why I would not recommend this work for publication, at least in its present form:

1) Whether the LSW formation process is spotty or occurs over large areas, I could not find any convincing evidence in favor of one or another. To answer this question in a convincing way, the authors would need to use more data from both shipboard systems and Argo floats, and possibly satellite altimetry. A natural question I would raise here - "What new bold message do the authors deliver in the story?"

2) The ship data foundation used in the paper is somewhat weak - four sections taken in different seasons. Considering the variable character of LSW formation this is far not enough for the task. It is not as trivial as it seems to pinpoint the most recent convection site from a section occupied in Aug-Sep. The authors try to solve this by tracing the signal back with a single Argo float, but there are many factors working against this "connection". Whatever is seen at <1000 db on the section in fall might be influenced by LSW advected from elsewhere, replacing or/and mixing with a local mixed layer left from a past winter. Argo float trajectories (most parking depth >1500 m) may not be adequate for studying these mixing and restratification processes which would help to isolate local sources from external. In Table 1, the year for Ovide06 must read 2006.

3) The chemistry presented in the paper, especially CFC-11, appears too noisy. I can spot two deep "eddies" in the 2006 CFC-11, but not in T and S, could these "eddies" be caused by a drift in CFC system or bad standards. If the authors put their confidence in these features, a story describing the effects of mesoscale processes on tracer field would be of interest here. On the other hand, I would not link any vertically-coherent shifts in CFC or Oxygen data with lenses of older LSW. To be noted that the layer containing older LSWs is not thick enough to be properly resolved by traditional water sampling, so in some cases it could be just missed by individual stations, therefore I would question any association of local high/lows in CFC-11 with lenses of certain water masses.

Interactive comment on Ocean Sci. Discuss., 6, 2085, 2009.