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Ocean Science Discussions

Interactive comment on "Tracers confirm downward mixing of Tyrrhenian Sea upper waters associated with the Eastern Mediterranean Transient" *by* W. Roether and J. E. Lupton

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The paper entitle "Tracers confirm downward mixing of Tyrrhenian Sea upper waters associated with the Eastern Mediterranean Transient" by W. Roether and J. E. Lupton, tackle an important and hot scientific issue regarding the observations of tritium and 3He in the Tyrrhenian Sea during several vessel surveys ranging the 1987–2009 period, confirming the enhanced convective mixing of the intermediate waters into the deep waters, most likely associated with the Eastern Mediterranean Transient.

The present paper even is limited to a particular tracers of water masses is relevant to understand the impact of water characteristics on the main ocean processes like

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Interactive Discussion

Discussion Paper

mixing or most significantly on the evolution of the precondition phase of the deep water formation.

For all these reasons that the results of this paper could be very interesting for the oceanographic communities and in particular for those more implicated in the EMT study. Therefore I recommend this paper to be published, but some revision is necessary before to be published.

Because the phenomena described in the paper is very complex from technical point of view and in order to be useful for a larger scientist community, I have some suggestions for the authors that can improve significantly the physical paper value, in which most of those regarding the clearness of some sentences, and in particular the following ones:

1) Along the introduction it is worth to spent some words on the main characteristic of the deep water formation in particular in the Tyrrhenian sub-basin, is not enough cite the Gasparini's paper, in particular could be very useful to know where and when this convection take place in the Tyrrhenian sub-basin; 2) Figure 2, that personally consider one of the most import result of the paper, is difficult to understand for no specialized scientist the comment "Due to different solubility.....", please be more clear; 3) Figure 3, when the authors mention the staircase structure they want to refer at some particular phenomena like that analyzed by the paper of Zodiatis and Gasparini, 1996, Deep Sea Research Part I: Oceanographic Research Papers, Volume 43, Issue 5, Pages 655-678, in which that process is considered as a finger printer of less or more enhanced diffusion?, because this particular discussion is relevant for the main aim of the paper, please even in this case be more clear;

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