

Review of the manuscript “Changes in ventilation of the Mediterranean Sea during the past 25 yr”, A. Schneider, T. Tanhua, W. Roether, and R. Steinfeldt. Ocean Sci. Discuss. 10, 1405-1445, 2013.

General comments

The paper presents an evaluation of changes in the ventilation of the Mediterranean Sea during the last 25 years, using a combination of several transient tracers, and different approaches to estimate water mass ages. In addition to the ventilation the study also discuss the different age-estimate approaches. The approach is rather novel, and the combination of different tracers give more robust results. The work is interesting and well written and with good figures, but some additional figure in the introduction would be helpful for the description of the area (see Specific comments below). The paper is well suited for Ocean Science, and should be published after minor revision.

Specific comments

- 1) The Introduction starts with a description of the circulation and water masses in the Mediterranean Sea. For any reader not familiar with the area it would be very helpful with some figure(s) showing the geographical features mentioned, e.g., all basins, and the main circulation, and possibly also some figure/table of the mentioned water masses. In addition, or at least, this could be helped by adding some information to the text in the introduction, such that, for example, “In the Levantine basin...” get some more location description (e.g., in the eastern Mediterranean).
- 2) To me the whole start of the Result section (p.1414, l. 21-27; p. 1415, l. 15) should be moved to the Method section since this describes the parameters and the approach.
- 3) Add some information about how the average profiles are calculated (p.1415).
- 4) The statement on p. 1415 that the profiles south of Crete are more homogeneous is not clearly supported by all parameters, when comparing Fig. 3 and 4.
- 5) Estimate and/or discuss the magnitude of the uncertainty from the assumption of 100% surface saturation in the TTD-based age estimates (p. 1415). Overall the paper lacks any quantification of the uncertainties, as far as I can find. This may be less critical since the aim is to detect relative changes more than quantify exact ages. Nevertheless, some discussion of this would be in place.

Technical notes

p.1407, l. 12: “...in a view” is not clear to me; re-write.

l.21: “preconditioning” should maybe be replaced by “preconditioner”.

l.25-26: change order of sentence: “..., a slowly ventilated water body is found between 1200 and 2600 m depth.”

p.1408, l.4: Consider rephrasing “...to have happened...”.

l.5-6: Consider rewriting sentence “Enhanced salinities...”; not very clear presently.

l.17: The depth of the Sicily Channel is already mentioned at p. 1407 and can be removed.

p.1409, line 12: WMT is here referred to as Western Mediterranean Transient, but should be "...Transit" to be consistent. The same goes for p.1419, l.13.

p.1410, l.4: Edit the location of the parenthesis at the reference.

l.9: Is it correct to refer to the transient tracers as "conservative"?

l.26-27: Order the references chronologically.

p.1411, l.19-20: Edit the parenthesis at the references.

p.1412, l.9: Order the references chronologically.

p.1416, l.12: typo on "the TTD-based..."

p.1417, l.6: "...profiles do not.."

p.1423, l.3: Either remove "it" (in the end of the line), or maybe add something, like "shows" after "also" on the next line.

p.1427, l.25: Two of the authors are missing on the reference Waugh, "Relationships among tracer ages", 2003. – Hall and Haine