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Ocean Science Discussions

Interactive comment on "Assessment of the impact of TS assimilation from ARGO floats in the Mediterranean Sea" *by* A. Griffa et al.

Anonymous Referee #2

Received and published: 25 July 2006

Recommendation

Hardly acceptable as a regular paper. As part of a special issue with conference proceedings acceptable with major revisions.

Résumé

The impact of assimilating T and S profiles from Argo floats in an operational GCM of the Med. Sea is investigated. Synthetic observations obtained from a control run are

assimilated into a run started from distorted initial conditions, and the ability of the assimilation to bring the model run close to the control run is measured. Not surprisingly, the most effective float positions are found in frontal regions.

Major comments

1. The authors consider runs of 60 days after launch of Argo floats and from these runs draw conclusions of the optimal launch positions. However, Argo floats live for four years. Therefore, the launch positions are not very important as there is no control on the trajectories after launch. Rather than to look for optimal launch positions one should look for optimal coverage. Results from the first 60 days of a float's life are not very relevant for operational purposes. *A revised version should at least discuss this point.*

2. As I understand from the description of the assimilation method (p. 676), together with the explanation in lines 15-18 on p. 686, T and S are assimilated without adjusting the velocity. As shown by Burgers et al. (JPO **32** (2002), 2509-2515) this approach leads to sub-optimal results. *A revised version should at least discuss this point.*

3. In section 4.3 the authors compare the results from assimilating Argo data with those from assimilating XCTD data. This comparison suffers from two flaws, (a) as conceded by the authors XCTDs do not exist, and (b) the assimilation procedures are different. So what is the value of this comparison? *Omit in revised version.*

4. The paper can be considerably shortened by avoiding overlapping information. A lot of information from the Introduction is repeated in the Methodology section (e.g., lines 9-16 on page 673 and the last para on page 675; lines 10-19 on page

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674 and the fist para of section 2. Some of the figures are redundant or double (see below). *Do.*

Minor comments

p. 673, l. 6: relayed → released

p. 680, l. 15: front → frontal

p. 680, l. 18: front → float

p. 681, l. 19: maintain → remain

p. 682, l. 23: than → of

p. 682, l. 24: the double of → twice

p. 683, l. 19: notice → noticed in

p. 684, l. 23: less defined → less well defined

p. 686, l. 14: though → through

Figures, general: For differences (e.g., Fig. 5c) use a centered palette which clearly distinguishes between positive and negative, e.g., `light_centered`.

Fig. 5c: redundant, same as Fig. 6a.

Fig. 6: the panels have different colour bars

Fig. 6: "free-assim" as plot title should probably read "assim-free" - cf. legend and Fig. 7c.

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Fig. 7b: redundant, same as Fig. 5b.

Fig. 7c: redundant, same as Fig. 6b.

Interactive comment on Ocean Sci. Discuss., 3, 671, 2006.