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Interactive comment on “Observations of new western Mediterranean deep water formation using ARGO floats 2004–2006” by R. O. Smith and H. L. Bryden

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Received and published: 13 November 2007

Review of "Observations of new western Mediterranean deep water formation using ARGO floats 2004-2006" by R.O. Smith and H.L. Bryden

General Comments:

G1. This paper clearly shows that the formation of new deep water in the western Mediterranean Sea using Argo float data. Time-series data of temperature and salinity from Argo floats together with their positions are analyzed to present the formation of the new water. Characteristics of the new water are examined in the context of long-term change of water masses in the Mediterranean Sea as well. This paper would

contribute greatly to understand the formation process of the deep water in the region.

G2. Float 6900292 and 6900293 in the text(p.742) do not match their trajectories in Fig. 2. Reviewer has downloaded data from http://www.usgoda.org/cgi-bin/argo_select.pl and found a couple of errors in Fig. 2. Trajectory of 6900292 for 2004/2005 shown in Fig. 2 is, in fact, trajectory for 6900291 which is not used in this paper at all. Reviewer has confirmed that correct positions of 6900292 fit the description of this float movement in the text. Trajectories of 6900292 and 6900293 for 2005/2006 in Fig. 2 are mislabeled in color and should be exchanged to be correct. These mismatch and error make it very difficult to read the text in reference to figures. Authors should check carefully float numbers in the text, although it seems that subsequent description of deepwater formation is not affected by the mistaken Fig. 2.

G3. Discussion could be more focused by dividing it under subtitles as Introduction is well organized. First part of Discussion (753, 754 and down to 755, 22) reiterates findings in the previous section and could be shortened substantially.

Detailed Comments:

D1. According to the Argo home page (<http://www.argo.ucsd.edu>) it is recommended to use "Argo" rather than "ARGO" throughout this paper.

D2. (742, 14-15) Coordinates of float 6900292 do not match Fig. 2.

D3. (742, 22) cyclonic rather than anti-cyclonic?

D4. (744, 12) It would be helpful to indicate clearly in Fig. 6 when four cooling "episodes" occurred, since these events would be closely related to heat fluxes shown in Fig. 15.

D5. (745, 22-23) In Fig. 2 Argo float 6900293 was not around the central Ligurian basin at all.

D6. (745, 25-26 and Fig. 8) It should be pointed out that the first significant cooling

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occurred around November 9, 2004 in Fig. 8. Timing of this event is quite different from the first cooling for float 6900279 shown in Fig. 6. In fact, 6900279 detected a very significant warming around November 9, 2004 despite its proximity to the NCEP/NCAR location. Probably deserves further explanation.

D7. (749, 13) In Fig. 2 Argo float 6900293, not 6900292, profiled in the MEDOC region.

D8. (749, 19 and Fig. 14) Which is correct, 21 January in the text or 23 January, 2006 in Fig. 14?

D9. (750, 8-9 and Fig. 15) Three major cooling events in Fig. 15 do not match well four cooling "episodes" mentioned line 12, page 744. However, it appears that the three cooling events correspond well to time-series of potential temperature shown in Fig. 8.

D10. (750, 21) Year 2005 should be changed to 2006.

D11. (757, 23 and 758, 29) "regimes" might be "regions" instead.

D12. (758, 21-759, 10) In terms of physical processes before and during the deep-water formation this paragraph might be included as part of "the meteorological and hydrographic characteristics required for deepwater formation production coincide" on lines 24-25, page 757. If so, re-arrangement of paragraphs would make Discussion more logical.

D13. (767, Fig. 2) Longitudes are missing. Larger symbols like closed squares, cross and stars are suggested to make them easily visible.

D14. (774, Fig. 9 caption) Year should be 2005-2006 rather than 2004-2005.

D15. (780, Fig. 15 caption) Fig. 4 should be changed to Fig. 2.

Interactive comment on Ocean Sci. Discuss., 4, 733, 2007.

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