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Discussions

Interactive comment on "Snapshot observation of physical structure and stratification in deep-water of the South Caspian Sea (western part)" *by* P. Ghaffari et al.

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The paper address relevant scientific questions within the scope of OS. The paper present novel data in poorly studied region of the Caspian Sea. The authors give proper credit to related work and clearly indicate their own contribution. The number and quality of references appropriate. The description of experiments and calculations sufficiently complete with the exception of time interval of observations. The scientific methods and assumptions valid and clearly outlined. Mathematical formulae, symbols, abbreviations, and units correctly defined and used with one exception. Figure 2c shows specific density of sea water (so-called "sigma") in-situ, but not sigma-t

as pointed in this panel. In this context more relevant use specific potential density (sigma-tetha). The title clearly reflect the contents of the paper. The abstract provide a concise and complete summary. The overall presentation well structured and clear. The language fluent and precise. Substantial conclusions are reached, but some parts of the paper should be clarified: 1) It is unclear, what were external heat and freshwater fluxes (or at least air temperature and precipitation) immediately before the observations? 2) According to figure 3 in layer between 0 and 150 m depth only its upper part between 0 and $\sim$30 m had sufficiently low static stability. At a depth from 30 m to 150 m were not any signatures of winter convection (see also fig.2c, where all of density isolines have quasi-horizontal orientation). 3) According to classic definition of water mass (Mamaev O.I. Temperature-Salinity analysis of World ocean waters. Amsterdam: Elsevier, 1975. - 374 p.) in figure 3 may identify surface and deep water masses (with core index at respectively ends of T,S-diagram) and subsurface water mass with absolute temperature maximum at a depth of 50 m. The layer between 50 m and 150 m had transitional T,S-properties and should be regarded as specific part of vertical T,S-structure, bat not a water mass. 4) In fig. 2d values of dissolved oxygen concentration above outer shelf and upper continental slope are very close to its climatic values, presented in (Tuzhilkin, Katunin, Nalbandow, 2005, see article references). But sea-ward of 20 km distance from inshore end of section there were strong negative anomaly of dissolved oxygen in all water column, may be associated with upward motion of water. Turn one's attention a very abnormal sea surface front of dissolved oxygen between 20 and 25 km in fig. 2d. The values of oxygen saturation percent drops seaward here from near 100% to 60-70%. It is very unordinary phenomenon because of sea surface temperature and salinity are horizontally homogeneous here (see figs. 2a and 2b). 5) According fig. 4 salinity is vertically quasi-homogeneous only in pycnocline between 50 and 150 m depth. In layer between 0 m and 50 m the salinity is dominant factor of significant density stratification (static stability). In layer between 150 m and 720 m salinity and temperature contributions in density stratification is equal. It's confirmed by $\sim$45 degree angle of local T,S-curve inclination. Vertical gradients of salinity (and

density) in two least layers are comparable with ones in subarctic zones of the World Ocean (see The World Ocean Atlas, 2005).

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