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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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According to the valuable and constructive comments of Prof. Tuzhilkin specially on the water mass issue of the south Caspian Sea the following improvements and some explanations are considered:

Page 2567; lines 1 to 10 will be changed as follow: as demonstrated in the Fig.4a, three section in T-S diagram of deep stations (stations 07 to 13) are separable. Based on the classic definition of water mass (Mamayev, 1975), two different water masses could be identified at surface layer down to 50 m depth and deep water mass from 150 m down to the seabed. The layer between 50 m and 150 m could be considered as specific part

of the T-S digram which has transitional properties. Therefore it could be concluded that diagram suggests there is a rather shallow surface layer above 50m, a water mass WM1 at 50m, another water mass WM2 at depth (720m and deeper), and a water mass somewhere near T=7.2 degree C and 12.29 salinity. The TS-values observed at 150m would then be the result of mixing between WM1 and WM2. In surface layer owing to freshwater intrusion the salinity is dominant factor and has vertical gradient whereas the layer is almost constant in terms of temperature. In deep layer (lower than 150 m), the T-S curve inclination is approx. 45 degree which confirm equal contribution of temperature and salinity in density field stratification. Additionally Fig.4a illustrate while temperature has considerable vertical gradient in pycnocline between 50 m and 150 m, in terms of salinity it could be considered as vertically quasi-homogeneous.

Page 2570; lines 18 to 21 will be changed as follow: although salinity shows quasi-homogeneous pattern in pycnocline between 50 m to 150 m depth, there are vertical salinity gradient in both surface and deep layers. While the salinity is main factor of significant density stratification (static stability) at the surface, in deep layer concerning the 45 degree T-S curve inclination it plays the equal role as temperature in the density stratification. Therefore the salinity structure across the water column and density field which are comparable with ones in subarctic zones at the World Oceans (WOA05, 2005), enable us to classify the south CS waters as subarctic type.

Page 2555; line 17 three different water masses will change to two different water masses

Page 2557; line 28 will be followed by: Table 1 shows recorded meteorological parameters during January 2008 at Anzali Synoptical Platform, covering the extreme winter condition and expedition time.

Page 2570; Lines 12, 13 and 18 Line 12: three different water masses will change to two different water masses Line 13: middle water mass will change to a transitional part Line 18: three sharply will change to two sharply

Page 2568; Lines6, 7, 17 and 18 Line 12: three water will change to two water Line 7: surface, middle and deep waters will change to surface and deep waters Line 17: three clearly will change to two clearly Line18: in the study area will be followed by which are separated by transition layer with 100 m thickness

Concerning the winter convection most probably the resolution of Fig.2c is not enough, as a matter of fact the isolines are not horizontal and there is an inclination in shallower parts especially as proceeding toward the continental shelf. We tried to show this feature in the instability figure by choosing stations no 13, 10 and 07 from outside to inside which illustrate deepening of isolines as observer goes toward to the continental shelf.

Page 2570; line 23 will be followed by: additionally comments from Prof. V. S. Tuzhilkin as paper reviewer were highly appreciated and contributed to the final formulation of some aspects of the paper.

Interactive comment on Ocean Sci. Discuss., 6, 2555, 2009.