

Reply to Referee #1

We thank the Anonymous Referee #1 for the effort in reviewing the manuscript and for her/his positive evaluation. The posted comments have help us to improve the manuscript.

The manuscript provides some calculations on the double diffusion or salt fingering processes in the Southern Adriatic Pit, which were somehow missing till now in the literature, although known to occur in the Adriatic and Mediterranean. The authors use long-term fixed mooring, in contrast to majority of similar studies which are based on the Argo profiling floats. I found the manuscript clearly written, focused and well organised, with just a few minor comments to raise:

Thank you very much for the positive evaluation. We made changes following the Referee comments and suggestions.

- Fig. 1. The figure is hard to read, for example positions of Argo profiling float. It might be better to have 2-D plot with clear colours, e.g. blue for bathymetry, dashed arrows for deep currents, etc.

Thanks to the reviewer for the suggestion. A new figure with more information in 2-D has been added substituting the previous one.

- Lines 106-111. The authors claim that introduction of VL variable in this study is something innovative. However, I cannot get this from the manuscript - maybe to explain or justify this (Why is innovative? Maybe a bit better explain the variable), here or in results where you present the variable.

The VL is a key quantity, it is used 22 times in the paper. When introduced in the paper (Data and Methods section), it was and is written:

Line 111: “To evaluate further the water mass-properties in the vertical, we calculated the vector length (VL) defined following Eq. (2):

$$VL = \sqrt{\left(\alpha \frac{d\theta}{dz}\right)^2 + \left(\beta \frac{dS}{dz}\right)^2}.$$

To the best of our knowledge, the VL has not been discussed in connection with stratification and the Tu. A higher VL indicates an increased change of water-mass properties and therefore emphasizes the importance of Tu. On the other hand, when the VL is small the water column is essentially unstratified and changes in the Tu insignificant.”

We now added:

Line 116: A water mass is characterized by (T,S), its temperature and salinity. The variables (Tu,VL) are simply the polar coordinates in (T,S) space. It is Tu that determines the stability regime and VL the significance.

- Figs A2 to A5 might be better to place as supplementary material, not to weighten the article as appendix, Fig. A1 looks nice and would be better to be placed in the main article.

Figs A2 to A8 (now A1 to A7) will be placed as supplementary material, as suggested by the reviewer. Fig A1 has been merged with Fig 2.