

Interactive comment on “About the seasonal and fortnightly variabilities of the Mediterranean outflow” by C. Millot and J. Garcia-Lafuente

Anonymous Referee #1

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This paper uses a compilation of recent data from the Strait of Gibraltar to look at the processes leading to variability of the Mediterranean Outflow. The results are significant; they show a marked seasonal variability in outflow characteristics, as well as some indication of fortnightly variability. Both types of variability are due to mixing processes within the strait (rather than processes within the Mediterranean).

While the findings of this paper, in my view, deserve to be published, I think the authors could do more to explain their work and to outline the processes leading to these results. For this reason I recommend major revision; see below for a number of suggestions on how these revisions could be achieved (some minor, some significant).

1. I found that last sentence of the abstract confusing – the "outflow entering the strait" could be written as "Mediterranean Waters entering the strait", while the last part of

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the sentence might be written as: "predicting the characteristics of the outflow to the ocean appears almost impossible."

2. I found the abbreviations used made the manuscript very difficult to read. I am quite comfortable with defined water masses (e.g. WIW, SAW, NACW) being described by acronyms. However the abbreviations MWs, AW, Cs, Es, and Ms should be expanded.

3. The first sentence of the introduction notes assumptions made by other papers; these papers need to be referenced.

4. There is a long description of current hypotheses of the structure of water masses within the strait on page 2046. I found this very difficult to follow, and suggest that a cartoon may be useful in showing these ideas.

5. The Moroccan Shelf data is barely used in the paper; it should be more clear at the start of the data analysis as to why this data needs to be included (or else it could be omitted).

6. The seasonal variability noted here is the strongest part of the paper. The T-S diagrams clearly show a nice distinction between winter and summer mixing between the two incoming water masses. However, this section finished with a short conjecture explaining why mixing may be dependent upon seasons. It would dramatically enhance the paper if that explanation could be described more clearly and in particular backed up with some more solid evidence.

7. The fortnightly variability section is relatively weak, and much more needs to be answered here. Are these data from summer or winter? What defines atypical neap periods and why is the mixing so different in these cases? The data is relatively sparse – why is this? and can more be done here?