To
Referee #2
and Cc
Dr. Giuseppe M.R. Manzella
ESSD Chief Editor,
Dr. Alessio Rovere
ESSD topical editor
and
the ESSD Editorial Support Team

Oristano, 11/05/2023

Subject: reply to Referee's comments on "A Mediterranean drifters dataset: 1998–2022" by Alberto Ribotti, Antonio Bussani, Milena Menna, Andrea Satta, Roberto Sorgente, Andrea Cucco, and Riccardo Gerin, Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-344

Dear Referee,

thank you very much for your valid suggestions. We have devoted our best efforts to improve the submitted manuscript, aided by your insightful comments. We conducted a point-by-point response to your comments and queries and the manuscript has been edited and corrected, accordingly. The details of these changes can be found in the ensuing point-by-point responses to each and every comment/suggestion.

Referee's queries are shown in *italics* to differentiate our replies introduced by a **REPLY:** in **bold**.

Best regards,

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**Anonymous Referee #2**
**Referee comments**
**RC2**: 'Comment on essd-2022-344', Anonymous Referee #2, 04 Apr 2023

*The article entitled "A Mediterranean drifters dataset: 1998–2022" contains a series of files with trajectories of different kinds of drifters deployed between 1998 and 2021. Lagrangian drifters are a very useful tool for understanding the surface circulation of the ocean, as well as for determining mesoscale and submesoscale structures that are related to areas of accumulation of larvae or plastics, among others. However, in this work, the dataset needs to be revised in order to be used by other users in the scientific community.*

*On one hand, title of the paper does not seem appropriate, since, as indicated in the manuscript, the first buoy deployment experiments were carried out in the years 1998-1999 but were not repeated until 10 years later, so this title is misleading.*

**REPLY:** We agree with the referee. We have changed the title in "A new released Mediterranean drifters' dataset"

*And on the other hand, some files (e.g. hrib_LCE230) are not related to Mediterranean tracks (they show latitudes of 68 – 70 ºN). The work needs a great deal of effort to improve its quality in order to be published.*

**REPLY:** We carefully checked the tracks and eliminated those outside the Mediterranean. Numbers of drifters' trajectories were recomputed accordingly.

## ABSTRACT

*Here, and along the manuscript, you say that the dataset belongs to 138 experiments but there are 204 tracks, could you explain why? trajectories of which drifters were divided?*

**REPLY:** We have simplified the text just mentioning the experiments without numbers that confuse the reader.

## INTRODUCTION

*Are there previous Lagrangian experiments in the study area? Why is this dataset important?*

**REPLY:** There have been a lot of Lagrangian experiments in the Med area which are published by OGS in the Mediterranean and Black Sea dataset (approximately 1700 drifter data since 1986): see for example 10.6092/B40CD642-9555-44FA-8B91-3CD88B6C225B, 10.6092/7a8499bc-c5ee-472c-b8b5-03523d1e73e9.
This dataset is important because it is composed of new data generated following the same procedures as the above-mentioned OGS datasets. This permits researchers to integrate and compare these data with previous released ones for scientific Mediterranean studies on circulation, climate, etc. We mentioned this in the Introduction leaving understood its importance, then highlighted in the Discussion and conclusions.
In the Introduction (page 2, lines 68-70 of the file with revisions) we wrote: "Recently, the OGS in Trieste has re-elaborated all drifters' experiments following standard and state-of-the-art procedures (editing and interpolation) already adopted for previously released Lagrangian datasets, then creating a new one freely available online."
In the Discussion and conclusion (page 12, lines 279-283 of the file with revisions): "Further, this dataset is also compliant and can be interfaced with the other drifter datasets produced by OGS in the Mediterranean and Black Sea which collect about 1700 drifter data starting from 1986 (Menna et al., 2017; Menna et al., 2018a; Menna et al., 2018b; Menna et al., 2019; Gerin et al., 2020), thus facilitating the use of a huge amount of drifter data available for scientific purposes in the Mediterranean basin (circulation, climate, etc)."

## THE DRIFTERS

*Table 1 and Figure 1: As above mentioned, some files are not from the Mediterranean Sea. Please remove them from this dataset and article, or include them but change the study area and so on. Some of these drifters are: hrib_LCE230; mrib_LCE227; mrib_LCE229; prib_LCE229; qrib_ LCE229; urib_ LCE229; vrib_ LCE229; (...).*

**REPLY:** We have deleted tracks outside the Mediterranean.

*In my opinion, in order to be able to draw conclusions about the Lagrangian motion, it is necessary to have several points of the buoy's motion, which allow for concluding how the circulation in an area is. In this work, many trajectories are presented with little data (less than 10), so I do not consider that they give information. I attach a table with all the available buoys and the number of data. Therefore, I recommend removing the files with a such small number of locations.*

**REPLY:** We are conscious of this but we think that also the very short tracks can be useful to describe the surface circulation in the basin by, for example, pseudo-Eulerian statistics as described by Poulain (2001; https://doi.org/10.1016/S0924-7963(01)00007-0). We left the user the choice to use them or not.

*Table 1 shows information about hybrid and temperature (LCH and LCF, respectively). Nevertheless, when I downloaded the dataset I did not find information related to this kind of drifters. Besides this, please, remove temperature information in the NetCDF information (SST) because there is no data about that (as well as along the manuscript).*

**REPLY:** We have eliminated this information from the dataset. We have explained the missing of these data with the sentence "Ancillary data like temperature, battery level or drogue presence were not considered as not available for all platforms" in the first lines of the 3rd paragraph.

*Following the data, you do not specify the units of zonal and meridional velocity in the files. I think you should explain how you calculate.*

**REPLY:** We have added the units of the zonal and meridional velocities in the metadata of the dataset. The explanation of the velocity computation is provided at the end of paragraph 3 with the following sentence "The velocities were then calculated as finite differences of the interpolated positions."

**Tracks 2009-100 2010: the CODE**

*Line 102. Measurements of CODE 110 cm x 15 cm? These values are confusing attending to Figure 2B.*

**REPLY:** The mentioned dimensions were indicating just the housing of the drifter, not well visible in the figure. We have decided to update the sentence, then considering the dimension of the whole instrument, sails included.

*Line 115: Could you check it with your data? And not only with this kind of a drifter.*

**REPLY:** Different types of drifters acquired with different sampling intervals from a few minutes to several hours but the dataset includes just processed interpolated data and not raw ones. As stated in the text, drifter data with an acquisition frequency between a few minutes to 2 hours were interpolated at 1-hour intervals, while those with acquisition frequency till or more than 6 hours were interpolated at 3-h and 6-h intervals, respectively.

**Tracks 2015-2022: coastal and offshore Nomad drifters**

*Line 156. Same here, in the dataset, there are no LCH and LCF files.*

**REPLY:** We carefully checked and there are just a few LCH and LCF files in the dataset. They are visible at columns 2, 3 and 4 of the table in the Referee's comments.

*Line 157. Were the Southtek drifters drogue? Why is not shown in Figure 2?*

**REPLY:** All types of drifters, Southtek ones included, were equipped with a drogue. This information was missing at paragraph 2.1 on CLD drifter where we added the sentence "A sail (0.5 m length and diameter) was attached below the drifter to enhance the drag below the water surface.".
Drogues figures and their dimensions have been added to Figure 2.

*Line 207. I do not understand: "A dedicated custom MATLAB tool..." What is this?*

**REPLY:** We are sorry for the misunderstanding. We meant script and not tool. Anyway we modified the sentence to better detail the process, as follows: "The exact stranding time is defined by the operator through the visual analysis of the plotted drifter's track."

*Line 213. "From the original 138..." Again, why? Which tracks?*

**REPLY:** In order to avoid any confusion, we have rephrased the sentence and simplified it as follows: "At the end of the whole procedure, the final dataset consists of 158 interpolated drifter tracks (Figure 4) with at least two data points.".

*Figure 4. Kind repetitive... you explain this in Table 1. There is a mistake in "th".*

**REPLY:** We have re-plotted the figure by considering only the tracks.

*Line 225. Which figure?*

**REPLY:** We have modified the sentence by indicating the number of the figure mentioned in the text (Figure 5).