

Comments for the following manuscript:

Title: Observations of phytoplankton spring bloom onset triggered by a density front in NW Mediterranean

MS No.: os-2013-42

Major comments:

This paper studied the phytoplankton bloom in the NW Mediterranean Sea and the density front in the area that is probably related to the occurrence of the bloom. Glider and satellite observations were used, which can provide insights to the three-dimensional structure of ocean properties and evolution and development of the bloom. The glider data are unique and of great value. I would like to suggest major revisions before publishing the paper in OS.

Specific comments:

1. If the authors can polish the language, it can add value to the paper. E.g., in Page 4 Line 9, “show” should be changed to “showed”.
2. I would like to suggest the authors adding the major purposes in the introduction section, which can be easier for readers to follow the logics of the authors.
3. In Page 5 Line 23, it is confusing by saying “Pitch angle was about 20 degrees”. What is the pitch angle for? The sensors? Or the glider? Please specify.
4. In Page 6 Line 11, which method is used for interpolation?
5. In Page 6 Line 16, I would suggest authors rephrasing the sentence “The glider ...” since what the WetLabs eco-triplet fluorometer measures is chlorophyll-a fluorescence and chlorophyll-a concentration is then calculated.
6. In Page 6 Line 18, was the sensor calibrated by the manufacturer or by yourselves?
7. How long did the glider maneuver for the whole mission?
8. Did the authors do quality control for the data, especially for chlorophyll-a? In Fig. 3, I assume the right panels are for chlorophyll-a. Have the authors thought about what caused the patchiness?
9. In Section 2.2, what did the authors post-process MODIS/Aqua data for? They mentioned SeaDAS. Which version of SeaDAS did they use? For comparing satellite and *in situ* glider measurements, how did they do the matchup? This must be solved. They also need to describe how many satellite images were used and the time span for those images.
10. In Fig. 1, the authors need to specify the directions of the tracks. Only saying outward and return sections is not enough. What is the spatial resolution of the bathymetry? What is the source of the bathymetry data? From NOAA or from somewhere else?
11. In Fig. 2, there are some texts overlapping in top panels. What are the units for salinity and temperature?
12. In Fig. 3, similar questions mentioned for Fig. 2 should be answered. In the text, authors indicated that the glider data were interpolated. Then what caused the gaps in the two

bottom panels. I have no idea about which panels is for what. Also for scientific papers, each panel in a figure should be assigned with a letter, such as (a), (b), This suggestion applies to all figures.

13. In Fig. 4, what do 'A1' and 'A2' mean? How do you define the bloom? In one figure containing satellite images for different days, the satellite images should cover the same area? Otherwise, it would be misleading as shown in Fig. 4.
14. In Fig. 5, what is x-axis for? Days of what? Very confusing.