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Interactive comment on "Spatio-temporal variability of micro-, nano- and pico-phytoplankton in the Mediterranean Sea from satellite ocean colour data of SeaWiFS" *by* M. Sammartino et al.

Anonymous Referee #3

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The manuscript submitted by Sammartino et al. entitled : ÂńSpatio-temporal variability of micro-,nano- and pico-phytoplankton in the Mediterranean Sea from satellite ocean colour data of SeaWiFS Âż contribute to the field of remote sensing of phytoplankton functional types by testing existing algorithm in a regional environment, namely the Mediterranean Sea. Work by Uitz et al. 2012 and D'Ortenzio et al. 2009 have already given an insight on the phenology and primary production of the Mediterranean Sea. The present work add some details on phytoplankton size distribution, which is consistent with the previous work.

The manuscript needs some editing and the grammar is sometimes weak. The introduction needs to be rewritten, a compilation of previous work and state-of-the-art

knowledge is discussed but with no real guiding thread, for instance, page 164, line 10 to 15, the effect of packaging effect is mentioned with no link to the previous paragraph, such that we wonder why is that statement coming there.

The main flaw of the study lies in the model used. Brewin and Hirata developed global models and the authors apply them out of context. I would suggest using the large dataset the authors have to fit the parameters describing Brewin and Hirata's model to their region of interest. It would be fairer to each model and provide more robust results.

The figure 2 is very difficult to follow; I would remove it or try to clarify it.

The authors emphasize the good performance of the regional model they are using. First, they should briefly explain the type of algorithm, is it a band ratio or an optimisation algorithm? They state that the rms of the model is 0.25 mg. m-3. Later in the manuscript (page 176 and 177), the authors state that they observed a change before and after 2004 from 68% to 70% for the maximum picoplankton contribution. Given the rms, how can they detect a change of 2% in pico-plankton over time given the rms (the same holds for the chlorophyll content per size class). I would recommend the authors to add some uncertainties about the measurements and some statistics to test if the changes observed are real or just some random artefacts.

After 2007, SeaWiFS started to collect data intermittently such that the data after that year have to be analysed and processes carefully. For instance, it would be interesting to have the number of observation used for each month (per pixels). It might appear that the monthly data after 2008 contains less observation, which could lead to some bias in the analysis.

The manuscript needs major revisions to be published in Ocean Science.

Interactive comment on Ocean Sci. Discuss., 12, 161, 2015.