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Interactive comment on “Effects of dust deposition on iron cycle in the surface Mediterranean Sea: results from a mesocosm seeding experiment” by T. Wagener et al.

Anonymous Referee #1

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General Comments

In this paper, the authors report the effects of dust deposition on iron cycle in the Mediterranean Sea in the frame of the interesting DUNE project. It appears that the authors obtained a very interesting dataset which is not easy given the complexity to develop such mesocosms in clean conditions. Furthermore, the paper is very well written. The abstract is clear and provides a major summary of the study. The introduction is well structured and the goal and the relevance of the paper are well-presented. The results/discussion is very interesting and improves our knowledge on the complex Fe cycle in seawater. This new kind of experiments (mesocosms) points out that the ef-

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fects of dust deposition are more complex than previously thought and shows that there is still work to do to understand the impact of this important source of Fe in surface waters. I think that this paper clearly merits publication. I just have very few detailed comments to address.

Specific Comments

- The explanation of the Fig. 5 should arrive earlier in the text. Explanations are given at the p. 2812 whereas some data are discussed p. 2811 (the net sink of up to $4 \mu\text{mol m}^{-2}$). To make the reading easier, and to understand how is calculated the value of $4 \mu\text{mol m}^{-2}$, I think that some information should be given at the beginning of the subsection p. 2811, l.10.

- p. 2817, l.3-9: The opposite effect between, in one hand the transport time and processes occurring in the atmospheric compartment which increases the dissolution and thus the impact in surface waters and in the other hand the fact that in areas receiving large dust deposition scavenging processes are enhanced is not clear enough. ... maybe this sentence should be rephrased.

Technical Corrections

-p.2801 : l.17-23 : Sentence difficult to read, too long. Should be divided in two distinct sentences.

-p.2804 : l.6: Mistake between [pFe] and [dFe]. This same mistake occurs several times in the text (p. 2804, l. 23; p. 2806, l.23; p.2812, l. 21).

-p.2806: “values up to 40 to 60 $\mu\text{g L}^{-1}$ ”. The maximum value of 60 $\mu\text{g L}^{-1}$ can't be observed on the Fig. 2 because of the scale which stops at 40. Furthermore, such high values (60 $\mu\text{g L}^{-1}$) are not found in the supplementary database.

-p.2812, l.14: dFe_stock_loss in $\mu\text{mol m}^{-2}$ instead of $\mu\text{m m}^{-2}$

-p.2812, l. 27: Fig. 5.b not 5.c

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-p. 2814, l. 20: “this hypothesis is consistent with the decrease in dFe...” not clear

-Figure 5, figure caption: “The definition . . . can be found in the text (Sect. 4.2), not (Sect.4.3.2).

-Figure 6, idem Sect.4.2 not Sect.4.3.2

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