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## ***Interactive comment on “Impacts of dust deposition on dissolved trace metal concentrations (Mn, Al and Fe) during a mesocosm experiment” by K. Wuttig et al.***

### **Anonymous Referee #1**

Received and published: 13 November 2012

The submitted manuscript deals with a dust addition mesocosms experiment conducted off Corsica in the W Mediterranean. The work follows dissolved Fe, Mn and Al concentrations over time following dust additions. In additions, the work calculates solubilities and discusses scavenging. This is a very nice piece work which deserves publication. However, my main concern with the submitted manuscript is the poor quality of the written scientific text, and the structure of the paper. This paper requires a number of iterations by the team of authors before resubmission. The team has a number of highly experienced scientists and these should be able to get this manuscript into shape. I have made a number of comments on the manuscript, and these are listed below. However, I have not much commented on the scientific phrasing of the results

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and discussion sections. I will leave it to the authors to improve these. P 13858. Line 2. Dust also supplies trace elements which are less abundant in rocks. P 13858. Line 5. Residence time is not directly related to speciation. P 13858. Line 12. The method section indicates that the dust was added as a dry substance. Hence we are not dealing with wet deposition! P 13859. 'Due to the elemental composition of the earth crust, the flux of dust particles constitutes a major source of trace metals to the surface ocean (Duce et al., 1991).' This sentence is awkward and does not mean much. Rephrase. P 13860. '.....and availability in the atmosphere and in seawater (Spokes and Jickells, 1996),.....' Availability of what. P13861 line 28: a key issue with oxidised Mn species is their insolubility, with the reduced form being soluble. P13862: The objectives are so convoluted that they are not very useful. P 13862, line 19: conservation instead of preservation P 13862, line 20: what is a typical summer oligotrophic condition? P 13862, line 21: entirely instead of purely P 13862, line 24: what does it mean that the water column was preserved? P 13863, line 7: how do water masses settle? P 13863: this sentence does not make much sense: 'Sampling for dissolved trace metals was conducted using 0.2  $\mu\text{m}$  Sartobran filter cartridges (Sartorius, Germany) adapted to a Teflon<sup>TM</sup> diaphragm pumping system and then the samples were directly collected into the cor20 responding bottles' P 13864, line 13: so to what pH were Fe and Al samples acidified? P 13864, line 15: I was not sure Kiel has clean rooms rated class 100. It is class 1000 or 10000. P 13864: you mean a diode array spectrophotometer P 13865, line 15: you mean < 1nM? Results: the description of the data format should be with the appropriate table. At present it is incomprehensible; it needs a rewrite. Table 2: what was the standard deviation: one or two sigma? Also, is there an standard deviation associated with the outside measurements? Page 13871: the Fe values by Boyle are better to be removed. They were obtained before ultra clean trace metal sampling/analysis for Fe. P 13872: consider discussing the outcomes of the inventory calculations first, before discssing the advantages of the higher sampling resolution P 13874: why calculate the solubility from the difference between the control and dust mesocosm inventories. An alternative option would be to use the inventory of the dust

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mesocosm just prior to dust addition. P 13874: the description of the calculation of the solubility is awkward, if not wrong. P 13879: ... the residence time of dFe in surface waters is strongly influenced by Saharan dust deposition...'. Explain which way the residence time was influenced: shortened?

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Interactive comment on Biogeosciences Discuss., 9, 13857, 2012.

**BGD**

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