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## ***Interactive comment on “Taxon-specific responses of Southern Ocean diatoms to Fe enrichment revealed by synchrotron radiation FTIR microspectroscopy” by O. Sackett et al.***

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The ms by Sackett et al. represents a substantial methodological step forward in the comprehension of the species-specific responses of marine phytoplankton.

With a little more courage, the authors could have also addressed the problem of individual heterogeneity. That could be the next thing to do!

The background information are slightly incomplete. For instance, Marchetti et al. 2010 L&O already used FTIR spectroscopy (although not on single cells) to investigate Fe and Si response of southern ocean phytoplankton. That paper needs to be cited. Also when referring to taxonomic application of FTIR the authors failed to cite the only two

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paper that actually use eukaryotic micro algae (I apologize if they happen to be mine, but such is life: Domenighni & Giordano 2009 J. Phycol; Giordano et al. Plant Ecology and Diversity 2 (2): 155-164. DOI: 10.1080/17550870903353088).

To play the devil's advocate, I would say that before SR-FTIR becomes a common techniques lots more synchrotrons need to be made available. at this stage the broad use of this approach is more a wish than reality. Perhaps the enthusiasm of the final paragraph should be somewhat mitigated.

This not withstanding, I find this ms a very interesting and easy read. I would have liked to do these experiment myself! I strongly recommend that it is published, with only minor changes (see above).

Mario Giordano

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Interactive comment on Biogeosciences Discuss., 11, 7327, 2014.

**BGD**

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