Biogeosciences Discuss.,
doi:10.5194/bg-2015-625-RC2, 2016

Biogeosciences Discussions
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Interactive comment on "*In situ* interactive characteristics of reactive minerals in soil colloids and soil carbon preservation differentially revealed by nanoscale secondary ion mass spectrometry and X-ray absorption fine structure spectroscopy" *by* Jian Xiao et al.

Anonymous Referee #3

Received and published: 4 April 2016

I recommend the manuscript to be published after minor revisions. This is an excellent research that employ a combination of cutting-edge techniques (NanoSIMS, EXAFS) to explore the mineral-carbon association in soil colloids. The results would be of great significance to improve current understanding of the soil C pool and its stability towards global changes. However, I have two comments on the manuscript. First, the effect of long-term fertilization on the Al and Fe mineralogy was not fully discussed, although the nano-SIMS revealed that Fe(Al) and C are coupled. I wonder if chemical extraction

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Discussion paper

experiments could help address the changes of FeãĂĄC speciation during the long-term fertilization. Second, I would recommend the author put Fig. 5 to the supporting information, as they already have the EXAFS data in Fig. 6 and the Fe EXAFS data are believed to be more informative and quantitative than the XANES data.

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