

Interactive comment on “Increased physical protection of soil carbon in the mineral soil of a poplar plantation after five years of free atmospheric CO₂ enrichment (FACE)” by M. R. Hoosbeek et al.

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This paper has done a delicate work on soil segregation of microaggregates disrupted from the macro-aggregates under poplar plantation that has been treated under FACE for somehow 5 years. Their work showed that significant C increase in iM-microaggregates rather than in the macro-aggregates under FACE. Also, they have been able to demonstrate that remarkable difference in C within iM-microaggregates between under the different poplar genotypes. While FACE effect on soil C storage may vary with plants, enhanced C storage was resulted from biomass increase and new or

young C incorporated into microaggregates within the larger macro-aggregates. This is quite controversy to the findings of others that the new or young C are generally in relatively free state (i.e, particulate C, C with macro-aggregates in sand or coarse silt size). Their results did not showed any difference in mass contents of macroaggregates or the iM-mcrioaggregates from the macro ones between the FACE or ambient treatments and between the plantations.The increased C in the iM-microaggregates may be the C not enough young and protected within the microaggregates when there are plenty of new or young C inputs to the external surface of aggregates under FACE, to which the soil microbes have generally easy access. Microaggregates have slow turnover rate and C were more or less stable (or old) in small sized microaggregates. We suppose that if there had not yet evidence that FACE enhanced formation of coarse sized microaggregates(sand or coarse sult-sized),the apparently increased C may be those preserved due to microbial preferable utilization of new or young C under FACE. C isotope signals or C partitioning among all the size fractions of microaggregates should be known in the future woks.

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