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Biogeosciences Discussions

Interactive comment on "How to link soil C pools with CO_2 fluxes?" *by* Y. Kuzyakov

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Y. Kuzyakov's paper reviews studies of the two research communities dealing with either pools (C-stocks) or fluxes (respiration). The missing overlap of the communities seems to be a matter of studied time scales: 1) carbon stocks are dominated by the carbon fractions of pools having slow turnover; 2) respiration is dominated by fast pools having fast turnover.

to section 4.1.2:

The describes assumptions might be too strong. By inverting decomposition models different from the two pool parallel model, both limiting assumption can be overcome: a) of parallel decomposition (e.g. Xue et al. 2006, Scharnagl et al. 2010) b) of first order kinetics (e.g. Wutzler and Reichstein 2008, Wetterstedt & Ågren 2011)

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In the parallel model the conceptual pools are defined by their decomposition rate. To my mind speaking about two separate pools with similar decomposition rates does not properly fit with this model concept.

to section 4.2.1:

The presented modeling of repeated 13C analysis uses a model that tracks litter cohorts with changing decomposition rate over time. Further explanation is required, how this relates to the MRT (mean residence times) of several SOM pools and respiration and their dis-accordance.

to section 4.2.3:

The paper assumes steady state conditions of stocks for the coupled approaches. Contributing to the sensitivity of the bomb-14C method, which often studies dynamics over several decades: the steady state assumption is probably violated for many sites.

References

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