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Quantifying carbon processes of the terrestrial biosphere in a global atmospheric inversion using in-situ and remote sensing data

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The objective of this work is directed at improving our understanding of the terrestrial carbon cycle and how this can improve the global atmospheric inversion simulations of the CO2 fluxes. This is carried out through developing an integrated system of models that couples biospheric and atmospheric processes across a comprehensive set of spatial and temporal scales.

In this study, we follow the same algorithm which has been presented in (Rödenbeck et al., 2003) and (Rödenbeck, 2005). In the standard inversion (by Rödenbeck), except for the rising fossil fuel component, the a-priori fluxes has no year to year variability which means that the Inter-annual variability of estimated fluxes be dominated by the atmospheric signals. Here we formulated a simple terrestrial land-surface model based on a pre-existing one (Lloyd & Taylor, 1994, Raich & Potter, 2002, Reichstein et al. 2003), simplified by Reichstein & Rödenbeck 2005. This biosphere model is driven by satellite data to produce among other things a space-time distribution of modeled fluxes "a-priori fluxes with small scale variability". By coupling biosphere model into the inverse model, land-biosphere processes can be split into their actions which can improve the understanding of the terrestrial carbon cycle.