INFERRING FLUXES OF BIOMASS BURNING FROM A GLOBAL CARBON CYCLE DATA ASSIMILATION SYSTEM (CCDAS)

M. Scholze[1], P. Rayner[2], W. Knorr[1], T. Kaminski[3], R. Giering[3], H. Widmann[4], C. Roedenbeck[4]

[1]*QUEST-Department of Earth Science, University of Bristol, Bristol, UK*
[2]*LSCE, Gif sur Yvette, France*
[3]*FastOpt, Hamburg, Germany*
[4]*MPI for Biogeochemistry, Jena, Germany*

ABSTRACT
The Carbon Cycle Data Assimilation System (CCDAS) infers values of the parameters controlling the function of a process model of the terrestrial biosphere using various observations. An obvious restriction of this approach is the limitation by the dynamics of the underlying process model. Careful study of the model-data mismatch and analysis of residuals can alert us to the presence of systematic errors which then candidate processes to extend the terrestrial biosphere model and the assimilation system. In a previous study, *Rayner et al.* [2005] noticed systematic underestimate of carbon release events in the tropics. The most likely explanation for this was the absence of any model of biomass burning in the biosphere model used in that study. Here, we extend CCDAS to infer the spatial and temporal patterns of biomass burning in the period 1979-1999. In a first attempt we include some flux components to account for missing processes. This so-called weak constraint form avoids biasing the inferences since the underlying model is no longer forced to match data without necessary processes. Also the magnitudes of the extra inferred fluxes quantify the missing processes.