



## **Modelling the Carbon Cycle Response to anthropogenic CO<sub>2</sub> Emissions: Uncertainties and Constraints**

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A comprehensive carbon cycle model was recently developed by coupling ECHAM5 (atmosphere), MPI-OM (physical ocean), HAMOCC (ocean biogeochemistry) and JS-BACH (modular land surface). Transient and scenario runs (1860-2100) have been set up according to phase 2 of the C4MIP initiative, which is conducted to quantify and disentangle carbon cycle - climate feedbacks. Such simulations show large differences in future land carbon uptake. So we will present results focussing on the uncertainties connected with the representation of the land biosphere. In particular, the interrelation of temperature- and moisture-dependent soil decomposition, partitioning of litter and the strength of CO<sub>2</sub> fertilisation will be discussed with respect to constraints implied by measurements. As a further important aspect of the future and present carbon cycle, CO<sub>2</sub>-sensitive leaf stomatal conductance, which affects the hydrological cycle, will also be considered.