



## **Eddy covariance flux measurements of energy, CO<sub>2</sub>, and O<sub>3</sub> over a mixed deciduous forest in a moderately polluted environment - comparison with a detailed multilayer canopy model**

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A detailed multilayer approach (“CANVEG” scheme) is applied to a temperate mixed forest stand in Germany to calculate the exchange of energy, CO<sub>2</sub> and O<sub>3</sub>. EC-flux measurements have been performed at the site during two intensive field campaigns in the growing seasons 2002 and 2003 (AFO2000-ECHO Project, see companion presentation by Thielmann et al. and by Kortner et al.). Scale appropriate data (LAI, in-canopy turbulence, soil surface exchange, branch enclosure measurements) are used for model parameterization and sub-model evaluation. The parameterized model is constrained using observed surface-layer meteorology and soil moisture status and temperature measured just below the soil surface. The exchange of energy, CO<sub>2</sub> and O<sub>3</sub> is quantified and the impact of vertical gradients within the canopy volume on net exchange is assessed. Model calculated net fluxes and vertical profiles of air temperature and scalar concentration (CO<sub>2</sub>, H<sub>2</sub>O, O<sub>3</sub>) are compared to observations. The impact of leaf physiological processes and in-canopy turbulence on the exchange of isoprene and the NO-NO<sub>2</sub>-O<sub>3</sub> triad are discussed.