Geophysical Research Abstracts, Vol. 9, 02988, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-02988

Dynamics of exchange processes of CO2 and 222Radon between forest floor, forest canopy and atmosphere

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The implementation of a long-term observation station to measure vertical profiles of the carbon dioxide and 222Radon concentration at the international FLUXNET site Waldtstein Weidenbrunnen (Germany, 50°09' N, 11°52' E, 775 m a.s.l.) was part of the measurement campaign WALDATEM-2006 during June 2006 and March 2007. The new developed CO2-profile-system attached to the 32 m tall main flux-tower is designed to measure at eight different heights above ground level (0.03 m up to 32 m) within and above a 19 m tall spruce forest simultaneously and to serve for the investigation of assimilation and respiration processes and the Net Ecosystem Exchange (NEE) of carbon dioxide in a tall canopy. For a better understanding of micrometeorological exchange processes (decoupling, inversion, counter gradients) ongoing extensive measurements of the 222Radon isotope as a tracer in the soil air and the near surface atmosphere in the sub-canopy layer are realized. First results are presented of the ongoing measurements of both trace gases regarding seasonal variation of exchange conditions between summer and winter half year in a European spruce forest of a mid altitude mountain area.