Geophysical Research Abstracts, Vol. 8, 04582, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04582

Global biogenic volatile organic compounds emissions estimated using a detailed vegetation canopy model

S. Wallens (1), J.-F. Müller (1) and A. Guenther (2)

(1) BIRA-IASB, 3 Avenue Circulaire, B-1180 Brussels, Belgium , (2) NCAR-ACD, P.O. Box 3000, 80307 Boulder, CO, USA

(sabine.wallens@aeronomie.be / Phone: +32-2-3730489)

Guenther *et al*., 1995 estimated that vegetation is the source of over 90% (1150 Tg C yr-1) of all non-methane hydrocarbons (NMHC) in the global atmosphere. These estimates, however, are still very uncertain, in part due to simplifications in the emission algorithms and in the vegetation information used in the model calculations. In the recent years, we developed a multi-layer canopy model (MOHYCAN) to estimate BVOC emissions (*Wallens*, 2004). In this model, a detailed parameterization of the radiative transfer is used to derive NIR and PAR in each layer for sunlit and shaded leaves. Leaf temperature is also calculated in each layer using energy balance equation at the leaf level. BVOC emissions are estimated using *Guenther et al*. algorithms. Detailed comparisons between BVOC emissions estimated by MOHYCAN and measurements have been performed to test and evaluate the emission algorithms. Next, we use the model to derive a new global emission inventory. We present here the BVOC emissions inventory at 0.5˚x0.5˚ resolution and a comparison of this inventory with *Guenther et al.*'s estimates. In addition, sensitivity tests have been made to evaluate the impact of using different parameterizations (such as the diurnal cycle of air temperature) or different datasets of meteorology and the leaf area index (LAI).

References

Guenther et al., A global model for natural volatile organic compound emissions, J. Geophys. Res., 100, 8873-8892, 1995

Wallens, Modélisation des émissions de composés organiques volatiles par la végétation, PhD Thesis, Université Libre de Bruxelles, 2004