Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07034, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07034
EGU General Assembly 2008

The effect of improved biomass burning emissions over Africa on the fate of aerosols in the atmosphere

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The radiative forcing due to aerosols is one of the major uncertainties in recent climate change assessments. Such assessments are based on numerical models which represent aerosols processes to the best of our current knowledge. Biomass burning is a significant but highly uncertain source of aerosols, both in terms of its strength and the temporal and vertical distributions. This paper examines the effects of improved representations of the emissions, their short-term variability and initial vertical mixing, on the fate of biomass burning aerosols in the atmosphere.

Biomass burning emissions over Africa show a strong daily cycle with a peak in the afternoon due to the human activities (e.g. Roberts et al., 2005). Recent analysis of CALIOP data have shown that the emissions from such fire are mainly injected into the planetary boundary layer (Labonne et al., 2007). In this study we perform simulations with the global model LMDzT-INCA considering these new results of relatively low injection heights and a strong daily cycle of biomass burning emissions over Africa. The effects on the vertical distribution and on long-range transport pattern will be presented in comparison to CALIOP satellite data.