Geophysical Research Abstracts, Vol. 9, 07352, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-07352

Using the structure of rainfall to predict NOx emissions from soil

G. S. McGrath (1), **C. Hinz** (1)

School of Earth Geographical Sciences, The University of Western Australia, 35 Stirling Highway, Crawley 6009, Australia (christoph.hinz@uwa.edu.au, +61 8 6488 1050)

Current modelling approaches for the prediction of nitrous oxide (N2O) emissions from soil suffer high uncertainty. This is due to uncertain parameterisation of often dozens of model parameters and uncertain process conceptualisations. While these calibrated models have to play a role for elucidating processes and experimental design, the high uncertainty makes their utility for predictions at ungauged sites highly questionable. Because N2O emissions are near surface processes largely controlled by soil moisture, rainfall is a first order control triggering emission events. In fact it is often observed that a few large emission events may contribute most to the annual emissions. This paper uses a minimalist probabilistic approach based upon the timing and magnitude of rainfall events to quantify temporal statistics of trace gas emissions. We show how the temporal structure of rainfall relates to the temporal structure of emission events within a probabilistic framework that also relates event timing to event magnitudes.