

Interactive comment on “Methane production from mixed tropical savanna and forest vegetation in Venezuela” by P. J. Crutzen et al.

Anonymous Referee #2

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General comments: The counter-intuitive results published by Keppler et al. (Nature 439, 187-191, 2006) that suggest potentially large emissions of CH₄ by vegetation under aerobic conditions have produced many strong reactions, both positive and negative. Crutzen et al. use the mean diurnal cycle of atmospheric CH₄ mixing ratios from a savanna region in Venezuela to show that significant emissions of CH₄ from vegetation are consistent with observations. I find their approach (using observations, in this case from 1988, to either support or deny the existence of CH₄ emissions from vegetation) far more useful than simply criticizing the scaling methods used by Keppler et al. (as in a paper by Kirschbaum et al., Functional Plant Biology, 33, 521-530, 2006; purchase from: www.publish.csiro.au/journals/fpb). Their main conclusions, that tropical savanna and forest are a significant source of CH₄ and that the ratio of CH₄

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production to NPP is in the range 0.002 to 0.004, provide observational support for the laboratory study of Keppler et al.

Specific comments: 1. From the figure, I estimate an increase in CH₄ at night of 6 ppb/hr, which corresponds to a nocturnal boundary layer height of 120 m for the emission rates given, similar to the value of 100 m given; is this a reasonable BL height? Please describe the uncertainties in this crucial step.

2. Please compare these emissions estimates with do Carmo et al. (GRL, 33, L04809, doi:10.1029/2005GL025436, 2006), who report observational evidence of CH₄ emissions from vegetation in the Amazon.

3. Please comment on the fraction of these emissions that could be from sources other than vegetation such as small wetland pockets and termites.

4. In the conclusions, the observed CH₄ mole fractions from the savanna are compared with a background globally averaged value from the same time. Would it make more sense to compare with a background tropical average? Also, where does the global average come from?

5. I suggest using units for the observations recommended by IUPAC, micromol/mol, abbreviated ppm, rather than volume mixing ratio, ppmv.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 3093, 2006.

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