Atmos. Chem. Phys. Discuss., 8, S6225–S6226, 2008
www.atmos-chem-phys-discuss.net/8/S6225/2008/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Methane plume over South Asia during the monsoon season: satellite observation and model simulation" *by* X. Xiong et al.

Anonymous Referee #1

Received and published: 21 August 2008

General comments: The authors report that AIRS CH4 retrievals from the upper-troposphere over the Tibetan Plateau show a seasonal maximum in late-summer and that this result is consistent with model runs using TM3. A separate model run with a 50% increase in CH4 emissions from rice agriculture show that the seasonal peak in CH4 emissions from rice coincides with the Asian summer monsoon to produce large CH4 values in the mid-troposphere. The paper also argues that, because the model mid-tropospheric CH4 values are greater than those observed by AIRS, estimates of emissions of CH4 from rice agriculture are too large. The results of the paper are reasonable and almost predictable. Because of uncertainties in the retrieved CH4 values and model transport, and that CH4 in the lower troposphere can not be accurately

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

retrieved from AIRS, I don't think the authors are justified in concluding that current inventories of CH4 emissions from rice are too large. The strength of the analysis is the impact of meteorology on Asian emissions, lofting CH4 into the upper troposphere. The paper is poorly written; one of the native English-speaking co-authors should edit it for grammar and punctuation. Some figures need to be redrawn. The SI unit for such "observations" is mole fraction.

Specific comments: P13454,L2: "observations" is a bit misleading; retrievals is more accurate. P13454,L20: CH4 GWP in IPCC FAR is 25. P13456,L22: remove "valuable AIRS products"; let the reader decide to what extent they are valuable. P13457,L11-22: why are results discussed in the introduction? P13457-8: A brief description of the retrieval method and its limitations should be described in "data and method". P13458,L27-28: fragment startting with "we tightened the quality control..." is unclear. P13459,L14-15: IPCC gives a range of estimates of emissions from rice agriculture; this is not the uncertainty. Recent studies converge on the lower end of this range. Section 3.1: are retrievals from other years consistent with the results shown for 2004. P13464,L18-20: As mentioned in the general comments, the I don't believe the larger CH4 values in the model simulations compared with AIRS is a strong indicator that the rice agriculture inventory of CH4 emissions is wrong. To do this properly, I suspect accurate total column measurements would be necessary. P13463, discussion of Figure 3: does the model give such a strong positive gradient in CH4 mixing ratio above box 2 in August to September? P13464, discussion of figure 4: green symbol described as blue in caption. Figures 5 and 6: both need to be redone with bolder lines and larger fonts to be more readable.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 13453, 2008.

ACPD

8, S6225–S6226, 2008

Interactive Comment