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Atmospheric Chemistry and Physics Discussions

# *Interactive comment on* "Greenhouse gas relationships in the Indian summer monsoon plume measured by the CARIBIC passenger aircraft" *by* T. J. Schuck et al.

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On page 2034, line 18-22:

Your statements "Satellite instruments, despite their limited vertical resolution, can provide information on the altitude range of the observed tracer enhancements. The observed monsoon plume in CH4 is for example reported by the AIRS instrument to extend from 500 hPa to 150 hPa (Xiong et al., 2009) . . ." are not correct. With regard to methane, AIRS measurements are sensitive to only about 1 piece of information spanning pressures between 150 to 500 hPa. AIRS places the plume between 150 to 500 hPa not necessarily because the plume is located between these pressure limits, but



because AIRS has difficultly sensing the plume outside this pressure range. Please refer to the following two papers for related discussion.

1. Maddy, E.., C. Barnet, 2008. Vertical resolution estimates in Version 5 of AIRS operational retrievals. IEEE Trans. Geosci. Remote Sens., 46, 2375-2384.

2. Xiong, X., C. Barnet, E. Maddy, C. Sweeney, X. Liu, L. Zhou, and M. Goldberg, 2008, Characterization and validation of methane products from the Atmospheric Infrared Sounder (AIRS), J. Geophys Res., 113, G00A01, doi:10.1029/2007JG000500.

On page 2034, line 16:

It is better to change the sentence ". . .elevated CH4 mixing ratios, although . . ." to the following: ". . .elevated CH4 mixing ratios, although the plume position reproduced from the model is slightly different from the AIRS observation (Xiong et al., 2009)."

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