

Interactive comment on “What controls the seasonal cycle of columnar methane observed by GOSAT over different regions in India?” by Naveen Chandra et al.

Anonymous Referee #1

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This paper shows that variability in XCH₄ measured by satellite over India cannot be simply attributed to spatial/seasonal variability of local sources but reflects also major influences from the free troposphere. This is a simple argument and is of some interest because there is indeed temptation to make such an attribution, and the paper shows clearly that it is incorrect. The paper also presents a nice analysis of the factors controlling methane in the free troposphere over India. The scope of the paper is limited (hence my rating of "Fair") because it applies only to India, and because a more thorough analysis of XCH₄ data (such as with an inversion) would obviate the need for the incriminated assumption. I was hoping to get a better understanding of methane sources in India but in fact this is not what the paper is about. Still, one could cite the

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paper as an admonition to pay attention to the free troposphere when making simple interpretation of XCH₄.

The presentation of the paper could be improved to make it more attractive: the writing is fastidious with too much details, the grammar and style are often poor, the postage-stamp figures scare the reader away (could you make do with fewer panels), and the math isn't clean.

One minor thing: on line 42, delete "increase in".

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2017-344, 2017.

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