Atmos. Chem. Phys. Discuss., 13, C1142–C1143, 2013
www.atmos-chem-phys-discuss.net/13/C1142/2013/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "On the consistency between global and regional methane emissions inferred from SCIAMACHY, TANSO-FTS, IASI and surface measurements" *by* C. Cressot et al.

Anonymous Referee #1

Received and published: 11 April 2013

Very useful comparison of three different satellite instruments using different detection and retrieval techniques for column heights of methane to infer global and regional emissions. Also compared with ground based measurements. Handling these very different data sets by assimilation into an atmospheric chemistry model seems the only way to produce consistent error statistics. Improvement in CH4 emission budgets is a commendable result.

It is appreciated that data retrievals are taken at face value from satellite data provider. However, outlyer SCIA data beg the question on possible causes. Some discussion on whether spectral resolution and spectral interval selected for measurement of CH4

ro-vibration spectra is appropriate, detector degradation and lost pixels all could add to understanding the cause of discrepancy. TANZO being an FTS uses quite different detection technique from SCIA, all having their own peculiarities. Furthermore, retrieval techniques are very different, SCIA/TANZO relying on ratioing with CO2, where interference from other lines (CO) could play a role. IASI, not sensitive to lower troposphere uses neural network trained on plausible answer, hence dependent on prior information.

I would appreciate some discussion on the underlying cause for data discrepancy and suggestion for ways to improve data set consistency.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 8023, 2013.