A comparison of Methane data products from Chemistry Transport Models, SCIAMACHY and a network of FTIR stations

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Since its launch in 2002, the SCIAMACHY instrument on board ENVISAT has provided information on a large array of species affecting our environment. Methane, a species for which the retrieval algorithm development is still ongoing, is believed to be an important greenhouse gas. Thus, to effectively study the impact of CH4 on climate, information on its sources and sinks needs to be improved. To this end Eulerian Chemistry Transport models coupled with emission data are often compared with the available satellite data. However, since both model-emission databases and satellite data are still very much under development, it is very useful to compare both with independent third party data.

In the framework of the EU project HYMN, the methane field as simulated by several Eulerian Chemistry Transport Models has been compared with data from a quasi-global network of groundbased Fourier Tranform Infrared (FTIR) spectrometers of NDACC.

The FTIR data have been harmonized across the network in order to eliminate any station to station biases resulting from different retrieval parameter settings such as the choice of the retrieval spectral microwindows and the a priori profile selection. The models in question are TM4 developed at the Royal Netherlands Meteorological Institute (KNMI), LMDz-INCA (Laboratoire des Sciences du Climat et de l'Environnement (LSCE)) and CTM2 from the University of Oslo. The impact of several emission inventories on the modeled atmospheric CH4 distribution will be assessed.

We will also discuss the inter-comparison of the latest IMAP-DOAS and WFM-DOAS CH4 SCHIAMACHY satellite products with said FTIR and model datasets, focusing on the seasonal cycle of methane.