

Inverting TROPOMI data with TM5-4DVAR

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Abstract

The idea is to extend the capabilities of the inversions done using the TM5-4DVAR model by making use of very high-resolution satellite data, like the S5P data available in-house, from the IUP Carbon and Greenhouse Gas Group. Such high-resolution data creates better spatial and possibly better temporal constraints compared to previous instruments. Additionally, a larger dataset allows for more rigorous filtering, which increases overall data quality and, therefore, confidence in the inversion results.

Recent efforts were focused on getting the most up-to-date version of the TM5-4DVAR code to run on our local AETHER cluster, as well as on implementing the necessary routines to run inversions using the in-house CO observations. In this talk, we will introduce the devastating Californian wildfires, from the end of 2018, as a testing case for the new S5P data and present the necessities one needs to consider when setting up such an inversion. These range from changing optimizer settings to accommodate the increased amount and density of the input data over finding proper starting conditions to the need for more recent additional (flask) observations.