EGU24-2121, updated on 13 May 2024
https://doi.org/10.5194/egusphere-egu24-2121
EGU General Assembly 2024
© Author(s) 2024. This work is distributed under
the Creative Commons Attribution 4.0 License.

Investigating NO_2 processing in power plant plumes from TROPOMI

Steffen Beirle and Thomas Wagner
MPI Chemie Mainz, Satellite remote sensing, Mainz, Germany (steffen.beirle@mpic.de)

The divergence, i.e. the spatial derivative of the horizontal flux, yields the local balance of sources of sinks. Strong positive divergence is observed for (and allows to quantify) NO_x emissions from point sources like power plants. Within the downwind plume, NO_2 changes due to (a) further NO to NO_2 conversion (NO_2 source, positive divergence) and (b) NO_2 reaction with OH (NO_2 sink, negative divergence).

In this study we aim to disentangle and quantify these competing effects based on the divergence of the observed NO_2 flux. We focus on large and isolated power plants where additional sources are negligible. Goal is to determine the time scales for the NO to NO_2 conversion and the NO_2 lifetime for power plant plumes.