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Pi-MAX: a new parametrized algorithm to retrieve vertical profiles of trace gases and aerosols from MAX-DOAS measurements

Julia Remmers, Steffen Beirle, Steffen Doerner, and Thomas Wagner
MPI for Chemistry, Germany

Multi-Axis (MAX-) DOAS instruments observe scattered sunlight under various mostly slant elevation angles. From such observations information on tropospheric profiles of trace gases and aerosols can be retrieved. MAX-DOAS observations can be used to quantify emissions and to study chemical processes in the atmosphere. Measuring (horizontally and vertically) averaged concentrations the technique can be used as a link between in-situ and satellite measurements. Thus satellite observations of tropospheric trace gases can be validated.
Π-MAX (**P**arametrized **I**nversion for **MAX**-DOAS measurements) is a parametrized method to retrieve vertical profiles of trace gases (such as H_2O, NO_2, HCHO, CHOCHO) and aerosols. No online calculations are necessary, since look-up tables (LUT) calculated with a Monte Carlo based radiative Transport Model are used. In this manner it is user-friendly, easy to distribute and applicable to every measurement location.
The here shown measurements took place in the Maldives in March, 2012, during the CARDEX campaign. Simultaneous sun photometry-, Lidar- and UAV-measurements provide the possibility to validate the new algorithm. We present time series of profiles of trace gas concentrations and aerosol extinction We discuss the effects of clouds on the retrieved results.