(6-220408-C) **Harmonization and Evaluation of Ground-based Instruments for Free-Tropospheric Ozone Measurements by TOAR-II Focus Working Group "HEGIFTOM"**

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The first phase of the Tropospheric Ozone Assessment Report (TOAR I) (Gaudel et al., 2018, Tarasick et al., 2019) showed that besides clear regional differences, the distribution and trends of ozone in the troposphere and tropopause region are not always consistent between datasets obtained from different standard ozone observing techniques. Therefore, within TOAR-II, to reconcile the different ground-based free tropospheric ozone retrievals, a focus working group has been initiated, aiming at (i) strengthening and expanding existing activities of harmonization within networks of well-established ozone measuring techniques (IAGOS, ozonesondes, LIDAR, FTIR and Brewer/Dobson Umkehr), and (ii) a cross-comparison of those homogenized data, and their associated uncertainties, at dedicated sites or for identical air masses (in case of e.g. ozonesondes and aircraft measurements). Furthermore, the development of tropospheric ozone retrievals with "new" techniques such as MAX-DOAS and Pandora is foreseen, including a comparison with established instruments at selected sites.

We will present results of harmonizing the different free tropospheric ozone data sets and show some examples of intercomparisons between different techniques at some multi-instrument sites.

References:

Gaudel et al., *Elem Sci Anth*, 6(1), p.39, doi: https://doi.org/10.1525/elementa.291, 2018.

Tarasick et al., *Elem Sci Anth*, 7(1), p.39, doi: https://doi.org/10.1525/elementa.376, 2019.

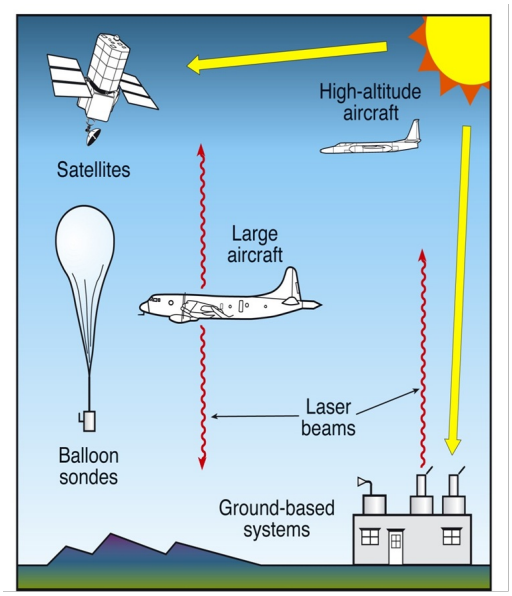

Figure 1. Schematic overview of different ground-based techniques retrieving tropospheric ozone involved in HEGIFTOM: ozonesondes, lidar, FTIR, IAGOS, Brewer/Dobson Umkehr, MAX-DOAS, Pandora.