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First observations of tropospheric δD data observed by ground- and space-based remote sensing and surface in-situ measurement techniques at MUSICA's principle reference station (Izaña Observatory, Spain)

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The main goal of the project MUSICA (Multiplatform remote Sensing of Isotopologues for investigating the Cycle of Atmospheric water) is the generation of a quasi global tropospheric water vapor isototopologue dataset of a good and well-documented quality. Therefore, new ground- and space-based remote sensing observations (NDACC-FTIR and IASI/METOP) are combined with in-situ measurements.
This work presents the first comparison between in-situ and remote sensing observations made at the Izaña Atmospheric Research Centre (Tenerife, Canary Islands, Spain).
The in-situ measurements are made by a Picarro L2120-i water vapor isotopologue analyzer. At Izaña the in-situ data are affected by local small-scale mixing processes: during daylight, the thermally buoyant upslope flow prompts the mixing between the Marine Boundary Layer (MBL) and the low Free Troposphere (FT). However, the remote sensors detect δD values averaged over altitudes that are more representative for the free troposphere. This difference has to be considered for the comparison.
In general, a good agreement between the MUSICA remote sensing and the in situ H_2O-versus-δD plots is found, which demonstrates that the MUSICA δD remote sensing products add scientifically valuable information to the H_2O data.