



Ozone Sonde Data Quality Assessment: New Insights from the Joint JOSIE 2017-SHADOZ Campaign

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Ozone sounding records constitute the longest time series of the vertical ozone distribution between the surface and 30-35 km altitude. Vertical ozonesonde profiles provide the single data source with sufficient vertical resolution to resolve the vertical ozone gradients, particularly at the tropopause region. Ozonesondes also constitute a backbone for keeping ozone measuring satellites calibrated and maintaining the long term stability of the global ozone record. However, ozonesonde instruments of various types have discrepancies and bias with one another, even when the modern electrochemical concentration cell (ECC) sonde, currently the standard device in the global ozonesonde networks (GAW-NDACC-SHADOZ), is used.

To resolve these inhomogenities the O₃S-DQA (Ozone Sonde Data Quality Assessment) started in 2012 and participated in LOTUS has shown that the overall uncertainty of ozonesonde measurements can be improved from about 10-20% down to 5-10%. The results obtained before and after the homogenization process have also shown that to achieve an overall uncertainty of 5% or better, a specific goal of the sonde user community, a very rigorous standardization of ground equipment and preparing/operating procedures for the sondes is necessary. In this context in October/November 2017, the joint JOSIE (Juelich Ozone Sonde Intercomparison Experiment) - SHADOZ campaign was conducted at the World Calibration Center for Ozone Sondes (WCCOS), established at the Research Center Juelich, Germany. The major objective was to resolve on-going discontinuities in the existing ozonesonde data records in general and particularly in SHADOZ (e.g. tropical tropopause layer) due to ground equipment, operating procedures, and changes in sonde manufacture and performance. The experimental protocol and first findings will be described. Special emphasis has been put on the use of new sensing solution types that may resolve discrepancies in the sonde performance.