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Ozone absorption cross-sections in the Huggins band: updated dataset.

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Both Brewer and Dobson spectrometers operate in the Huggins ozone absorption in the near UV (305-340 nm) with distinct absorption minima and maxima. This band is also the spectral region where ozone cross-sections have strong temperature dependence so that uncertainties in the assumed atmospheric temperatures add to the retrieval error.

One of the sources of uncertainty in the ozone retrieval by various methodologies is the selection of absorption cross-sections. Use of the different absorption coefficients results in the retrieved ozone amounts differing by up to 3 %.

The requirement to measure small changes in stratospheric and tropospheric ozone places strong demands on the accuracy of the ozone absorption cross-sections used in retrievals of spectra measured by remote sensing spectrometers.

New and improved measurements of the ozone absorption cross-sections were performed in the Molecular Spectroscopy Laboratory of the Institute of Environmental Physics (Bremen University). The region of interest is in the Huggins band (300 nm to 350 nm) with targeted uncertainties of 1–2 %. The new data will allow for further reduction of the uncertainties in the derived total ozone column for both ground- and satellite-based retrievals.