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Validation of the University of Bremen (IUP) GOME/SCIAMACHY long-term nadir ozone profile dataset and inter-comparison with the SBUV/2 long-term data record

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Stratospheric profile retrieval of ozone in the Hartley-Huggins band in nadir viewing geometry is one of very few options of obtaining a far-reaching time-series of ozone profiles. The IUP optimal estimation type retrieval including a spectral soft calibration based on the FULL Retrieval Method (FURM) has been successfully applied to a number of sensors: GOME (Global Ozone Monitoring Instrument) from 1995 to 2003, SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric Chartography) from 2002 to 2011, and GOME-2 from 2007 to now. Using the same retrieval settings and type of spectral soft calibration for each instrument leads to datasets which are very similar and can be combined with very little harmonization effort to a dataset spanning 18 years. This dataset can be extended with various future UV nadir spectrometers to be flown on a series of Sentinels, starting with TROPOMI (TROPOspheric Monitoring Instrument) on Sentinel 5 Precursor (S5P) to be launched in spring 2016. In order to evaluate the accuracy of this combined dataset by comparisons to ozonesondes and lidars are presented and the consistency with the SBUV/2 (Solar Backscatter Ultraviolet Radiometer) series are discussed.