



Upper stratospheric O₃ recovery as observed by IASI over 10 years of measurements

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In this study, we assess how daily ozone (O₃) measurements from the first ten years of the Infrared Atmospheric Sounding Interferometer (IASI/MetOp-A) operation can contribute to the determination of the processes driving O₃ variability and to the monitoring of long-term trends in the stratosphere. To that end, we rely on the IASI ozone profiles retrieved with the Fast Optimal Retrievals on Layers for IASI (FORLI) software set up at ULB for near real time and large scale processing of IASI data.

We present the global fingerprints of recent changes in the stratospheric O₃ measured over January 2008 – December 2017. Using a dedicated regression model applied on gridded daily mean O₃ time series, we discriminate anthropogenic trends from various modes of natural variability which are accounted for in the regression model by a series of geophysical parameters. The results show that the effectiveness of the Montreal Protocole is measurable by IASI in the upper stratosphere at a global scale and, more particularly, at mid-high latitudes of both hemispheres where the trend reaches +1.5 DU/decade. Nevertheless, we calculate that 5 years of additional measurements are required to detect an unequivocal upper stratospheric O₃ recovery of 11.5 DU/decade at a global scale.