Geophysical Research Abstracts
Vol. 13, EGU2011-6117, 2011
EGU General Assembly 2011

Spatial patterns of observed and modelled total ozone trends 1995-2009

Melanie Coldewey-Egbers (1), Diego Loyola (2), Walter Zimmer (3), Michel van Roozendael (4), Christophe Lerot (5), Martin Dameris (6), Hella Garny (7), Peter Braesicke (8), MariLiza Koukouli (9), and Dimitris Balis (10)

(1) German Aerospace Center, Remote Sensing Technology Institute, Wessling, Germany (Melanie.Coldewey-Egbers@dlr.de), (2) German Aerospace Center, Remote Sensing Technology Institute, Wessling, Germany (Diego.Loyola@dlr.de), (3) German Aerospace Center, Remote Sensing Technology Institute, Wessling, Germany (Walter.Zimmer@dlr.de), (4) Belgian Institute for Space Aeronomie, Brussels, Belgium (michel.vanroozendael@aeronomie.be), (5) Belgian Institute for Space Aeronomie, Brussels, Belgium (christophe.lerot@aeronomie.be), (6) German Aerospace Center, Institute for Physics of the Atmosphere, Wessling, Germany (Martin.Dameris@dlr.de), (7) German Aerospace Center, Institute for Physics of the Atmosphere, Wessling, Germany (Hella.Garny@dlr.de), (8) Centre for Atmospheric Science, University of Cambridge, Cambridge, UK (peter.braesicke@atm.ch.cam.ac.uk), (9) Laboratory of Atmospheric Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece (mariliza@auth.gr), (10) Laboratory of Atmospheric Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece (balis@auth.gr)

The European satellite-borne sensors GOME/ERS-2, SCIAMACHY/ENVISAT, and GOME-2/METOP provide an accurate global total ozone data record starting in June 1995. We present a monthly-mean averaged ozone product, which has been developed in the framework of ESA's Climate Change Initiative. It is called GOME-type Total Ozone - Essential Climate Variable (GTO-ECV), and it is constructed by merging those measurements. Due to its excellent long-term stability the GOME data record is used as a reference standard, while SCIAMACHY and GOME-2 observations are adjusted using correction factors obtained with an extensive intercomparison and analysis.
Such high-quality and homogeneous data sets are required to analyse the long-term behaviour of the stratospheric ozone content and detect statistically significant changes. A multiple linear least-squares regression algorithm using different explanatory variables is applied to the monthly-mean ozone product. Spatial patterns of ozone trends as well as the influence of changes in the chemical and dynamical structure of the atmosphere are analysed. Global trend estimates are also compared to long-term simulations obtained with two recent Chemistry-Climate Models (E39C-A and UMUKCA-UCAM), and total ozone observations of individual Dobson/Brewer ground instruments for selected geographical regions.