Geophysical Research Abstracts
Vol. 13, EGU2011-10048, 2011
EGU General Assembly 2011

Analysis of the tropospheric ozone distribution at Kerguelen island (49°S, 69°E) in 2008-2009

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We analyze a one-year campaign of 18 ozone-sondes performed at Kerguelen Island (49°S, 69°E), the first performed at this location. Tropospheric ozone distribution presents a large variability in summer and winter. The background level is more elevated in winter than in summer. Using correlative data from the Measurement of Pollution in the Troposphere (MODIS) instrument and the Lagrangian model FLEXPART 8.1, we show the influence of the southern hemisphere biomass burning season on this seasonal variability, especially the impact of the biomass burning activity in South America and Southern Africa. A case of stratosphere-to-troposphere exchange is identified on February 2009, with an enriched ozone layer anticorrelated with water vapor. The analysis based on the ERA-INTERIM global model data and on trajectories generated by FLEXPART 8.1 evidences the influence of a stratospheric filament into the troposphere induced by a curvature of the polar jet stream, mixed with a tropospheric subtropical air mass.