Supplementary material

Measurement and modelling of reactive halogen species over the tropical Atlantic Ocean

Anoop S. Mahajan, John M. C. Plane, Hilke Oetjen, Luis Mendes, Russell W. Saunders, Alfonso Saiz-Lopez, Charlotte E. Jones, Lucy J. Carpenter and Gordon B. McFiggans
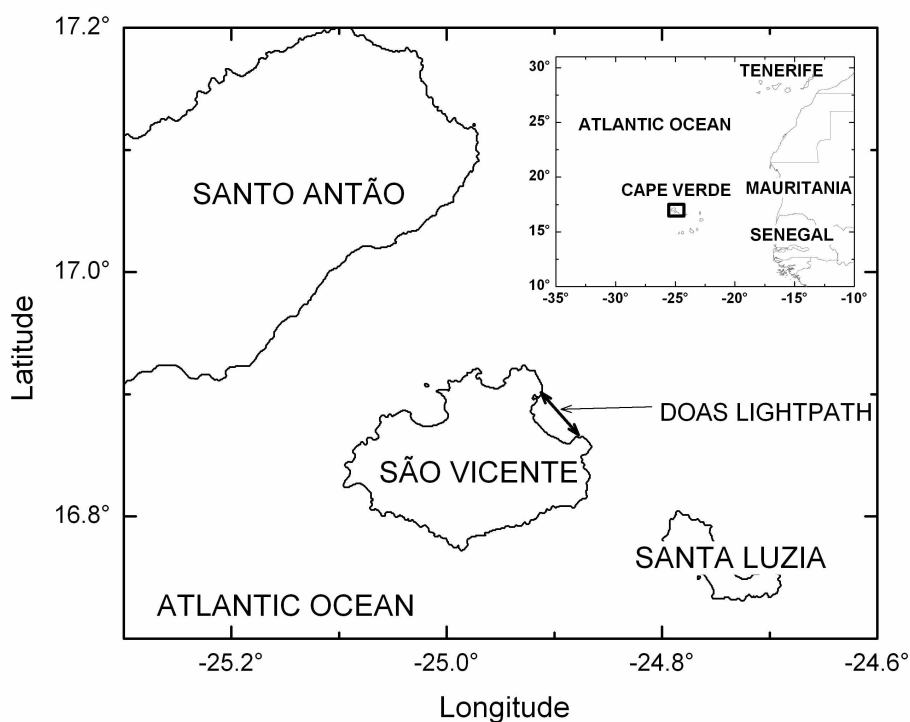
Figure S1: Location of the measurement site at São Vicente, Cape Verde. The DOAS light path was 6 km long (total 12 km) and is indicated on the island of São Vicente. The coastline was generated using the Coastline Extractor page hosted by the National Oceanic and Atmospheric Administration (NOAA)/National Geophysical Data Center, Marine Geology and Geophysics Division.
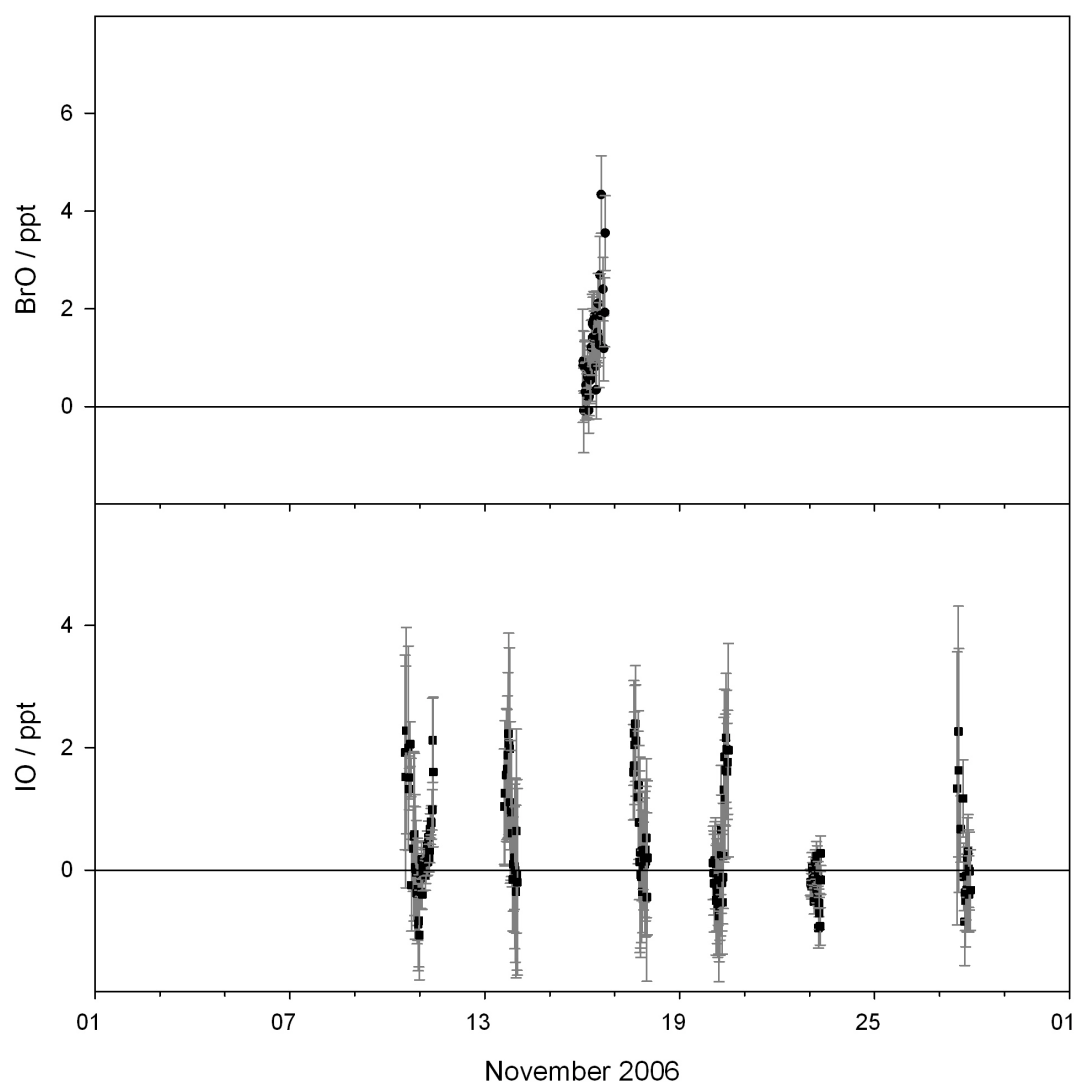
Figure S2: BrO and IO mixing ratios observed at Cape Verde during November 2006. The black circles indicate the BrO mixing ratio, black squares indicate the IO mixing ratio and the grey bars indicate the 2 sigma errors.
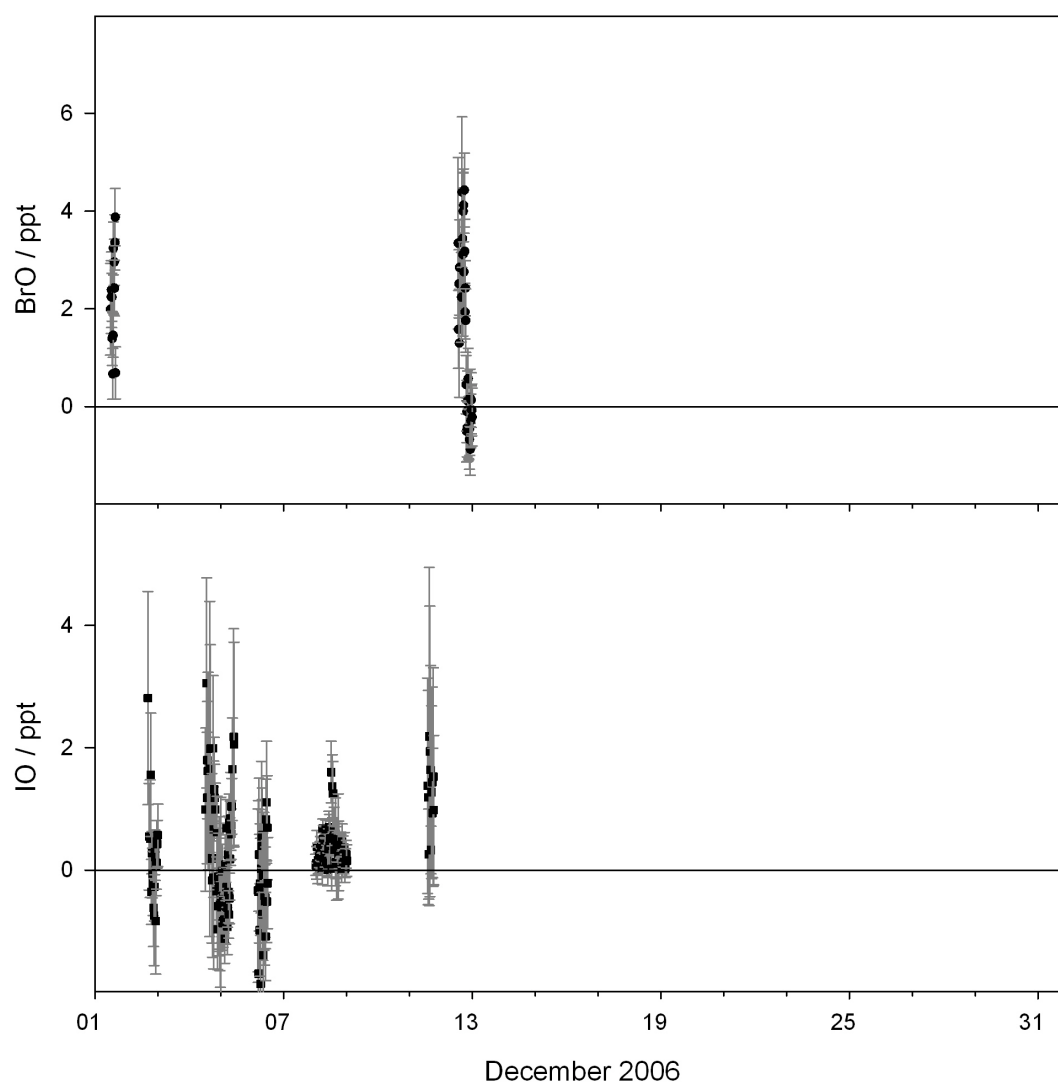
Figure S3: BrO and IO mixing ratios observed at Cape Verde during December 2006. The black circles indicate the BrO mixing ratio, black squares indicate the IO mixing ratio and the grey bars indicate the 2 sigma errors.
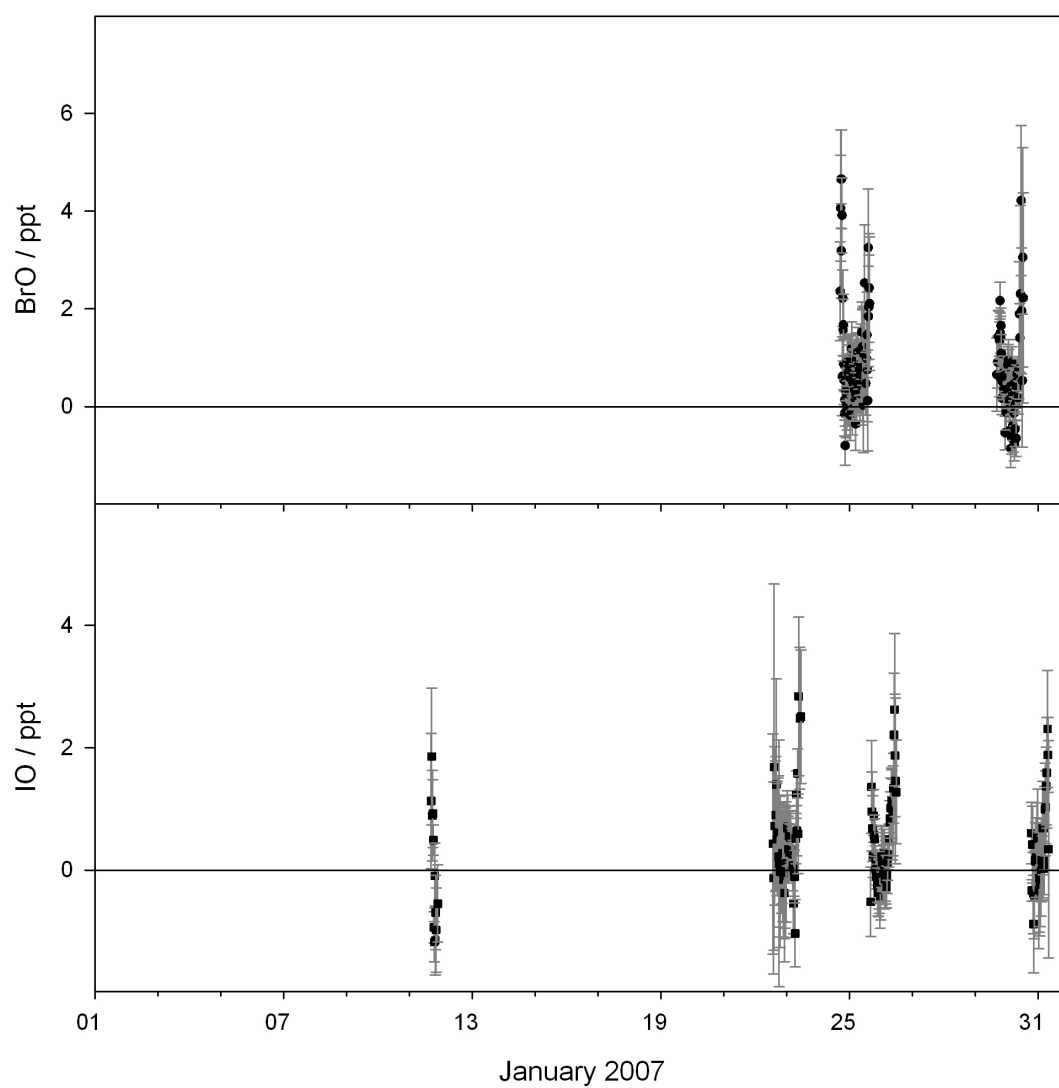
Figure S4: BrO and IO mixing ratios observed at Cape Verde during January 2007
2006. The black circles indicate the BrO mixing ratio, black squares indicate the IO
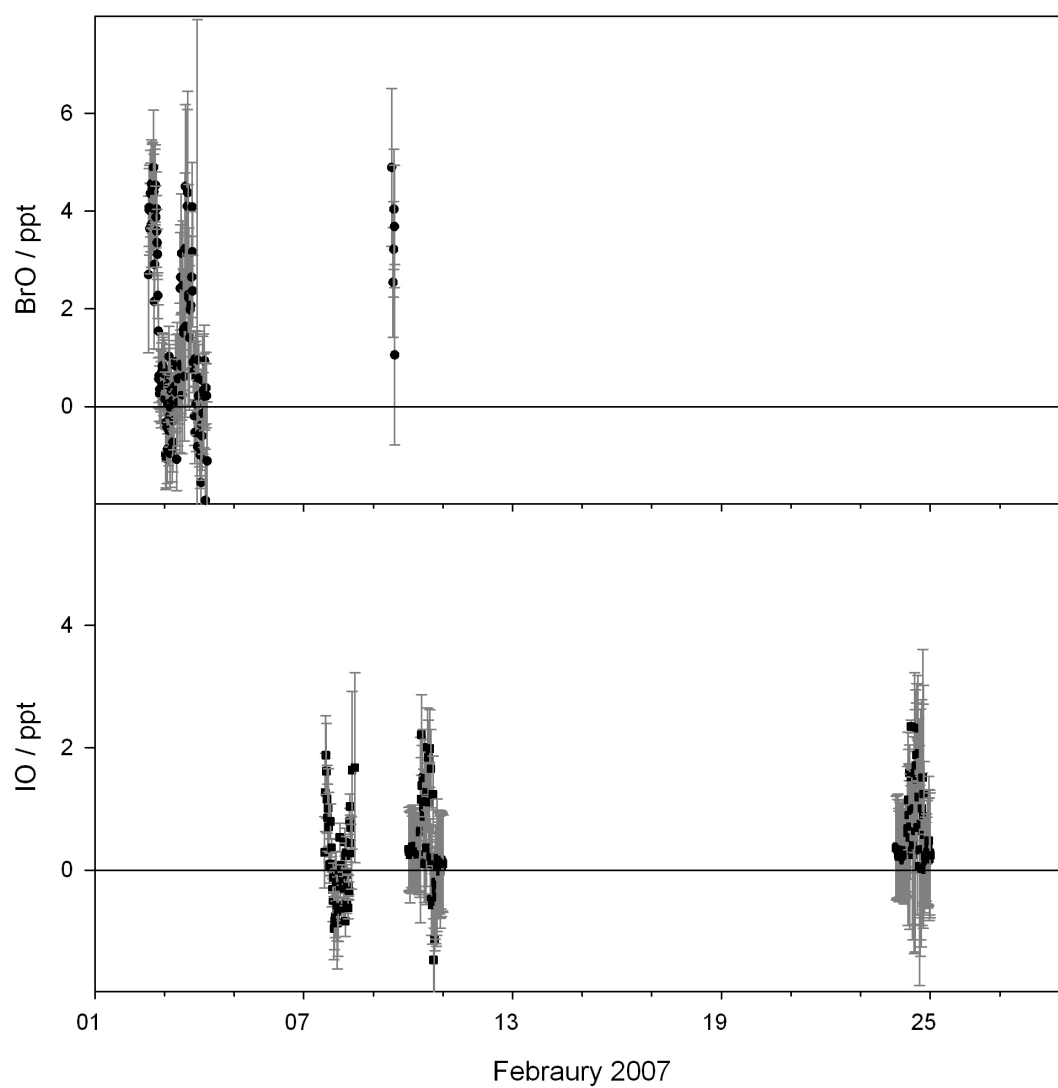mixing ratio and the grey bars indicate the 2 sigma errors.

Figure S5: BrO and IO mixing ratios observed at Cape Verde during Febraury 2007. The black circles indicate the BrO mixing ratio, black squares indicate the IO mixing ratio and the grey bars indicate the 2 sigma errors.
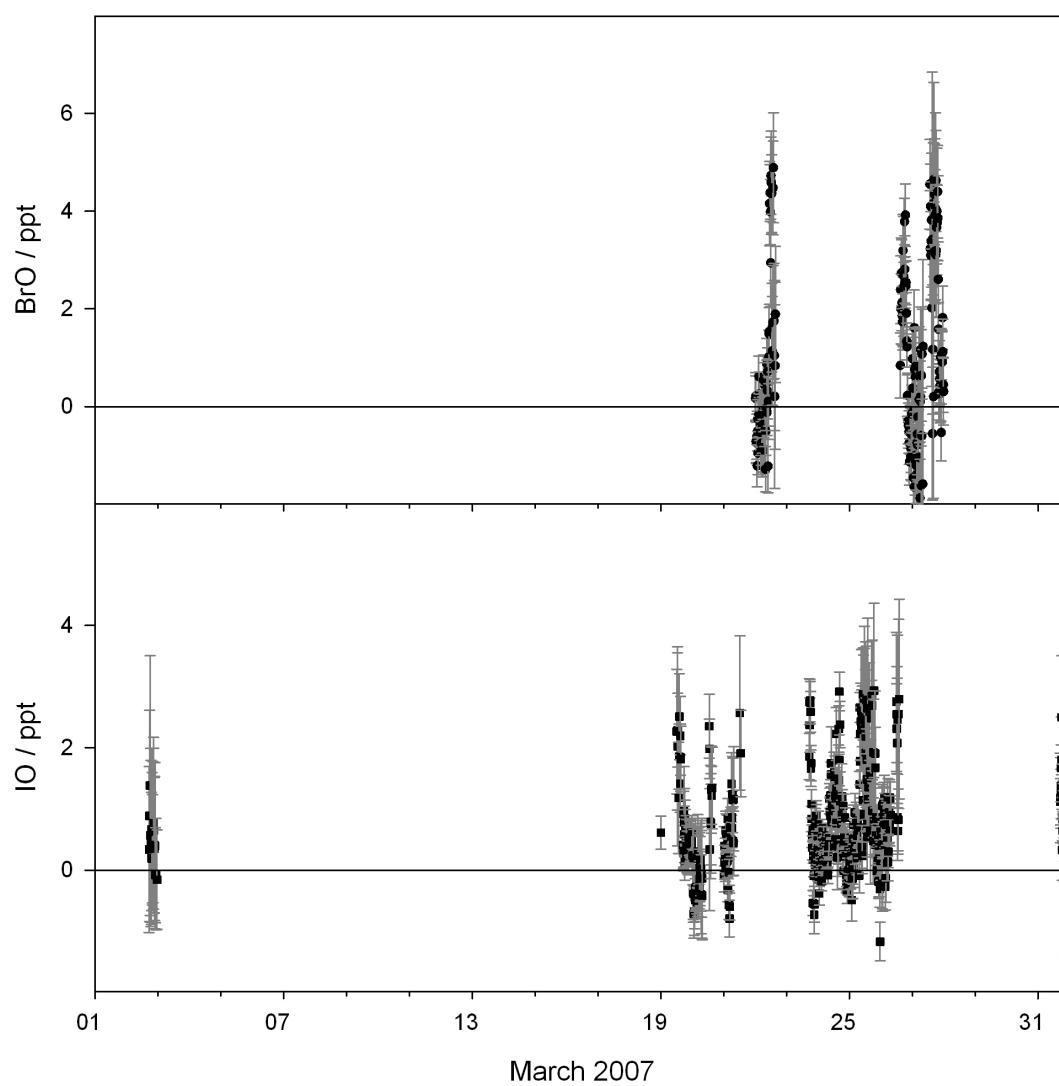
Figure S6: BrO and IO mixing ratios observed at Cape Verde during March 2007. The black circles indicate the BrO mixing ratio, black squares indicate the IO mixing ratio and the grey bars indicate the 2 sigma errors.
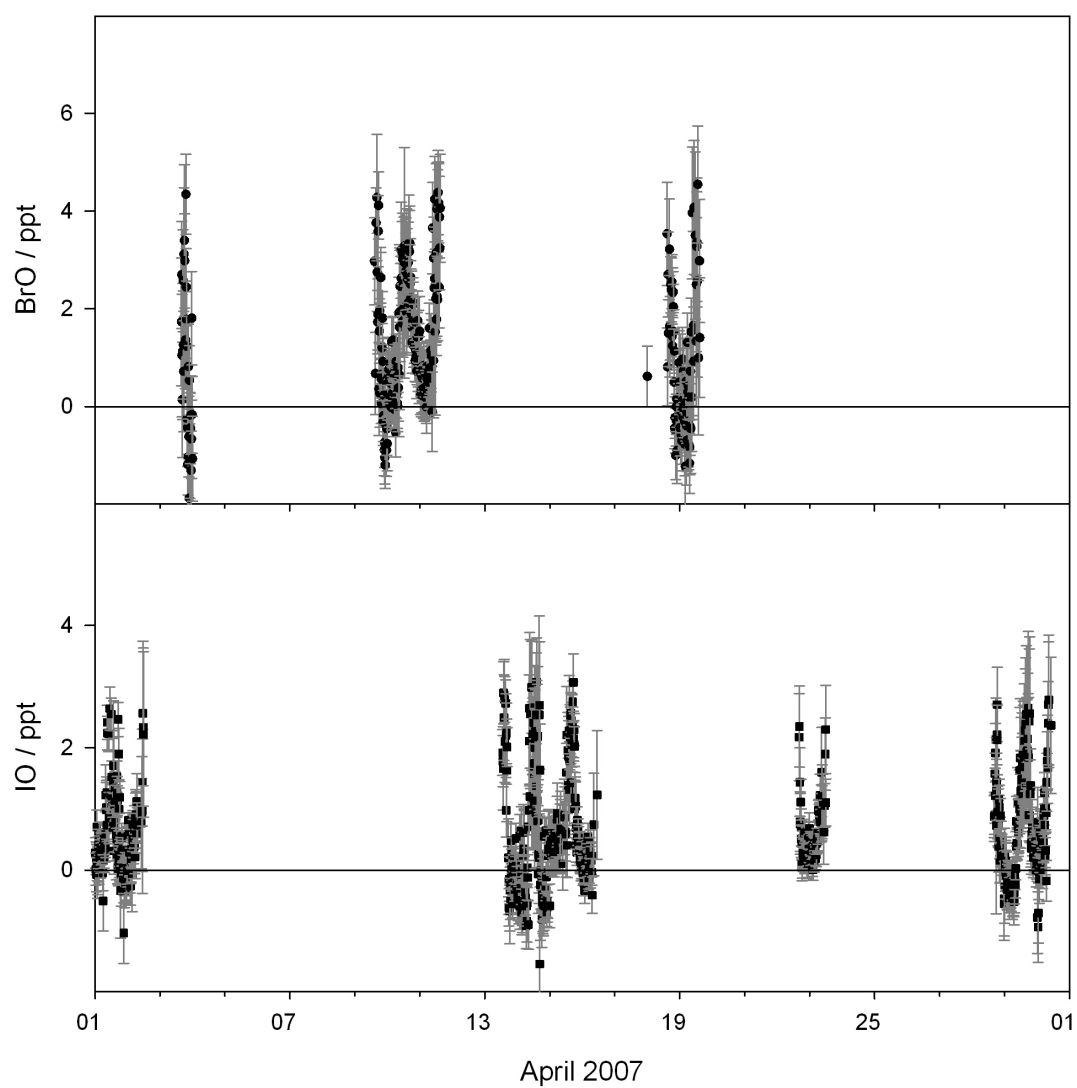
Figure S7: BrO and IO mixing ratios observed at Cape Verde during April 2007. The black circles indicate the BrO mixing ratio, black squares indicate the IO mixing ratio and the grey bars indicate the 2 sigma errors.
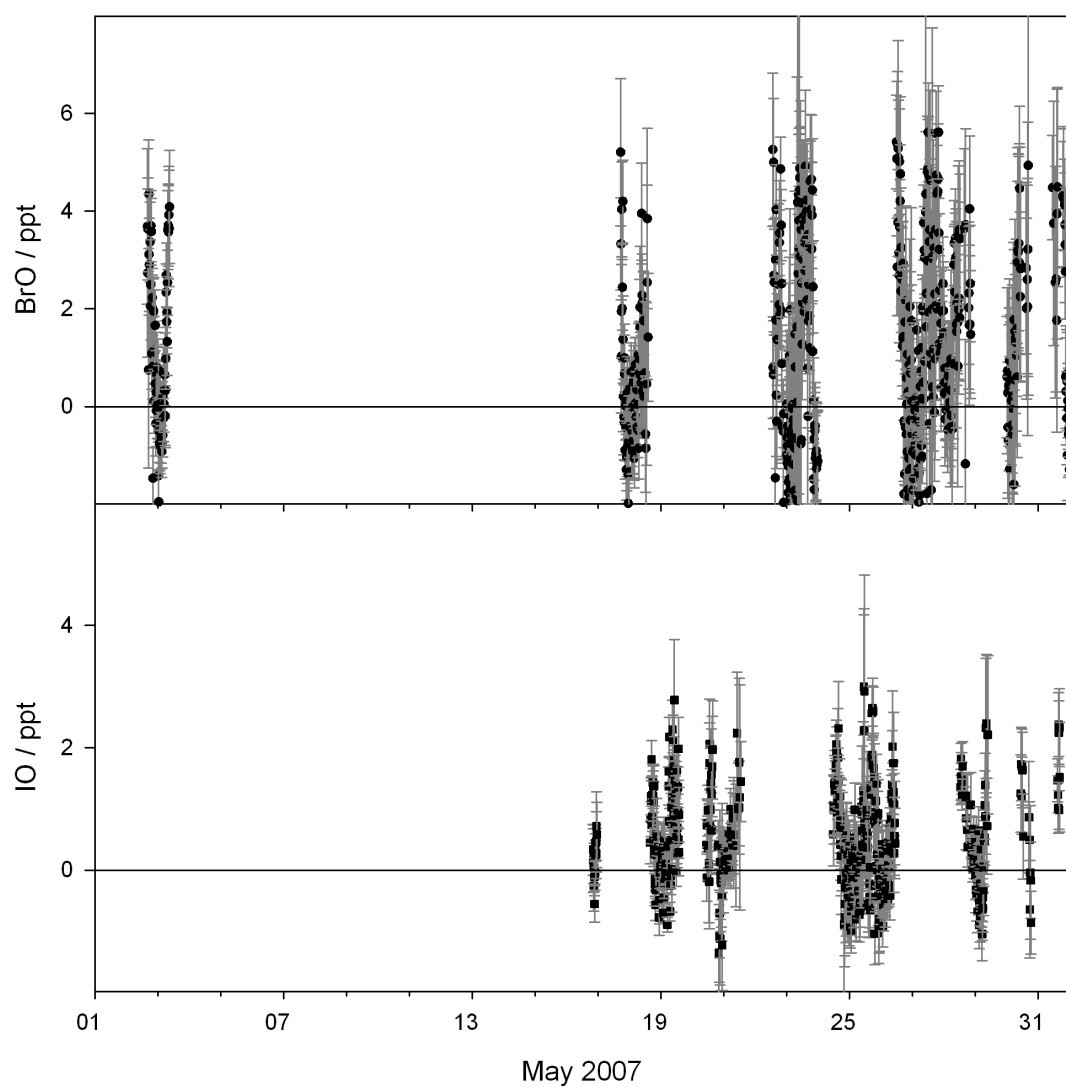
Figure S8: BrO and IO mixing ratios observed at Cape Verde during May 2007. The black circles indicate the BrO mixing ratio, black squares indicate the IO mixing ratio and the grey bars indicate the 2 sigma errors.
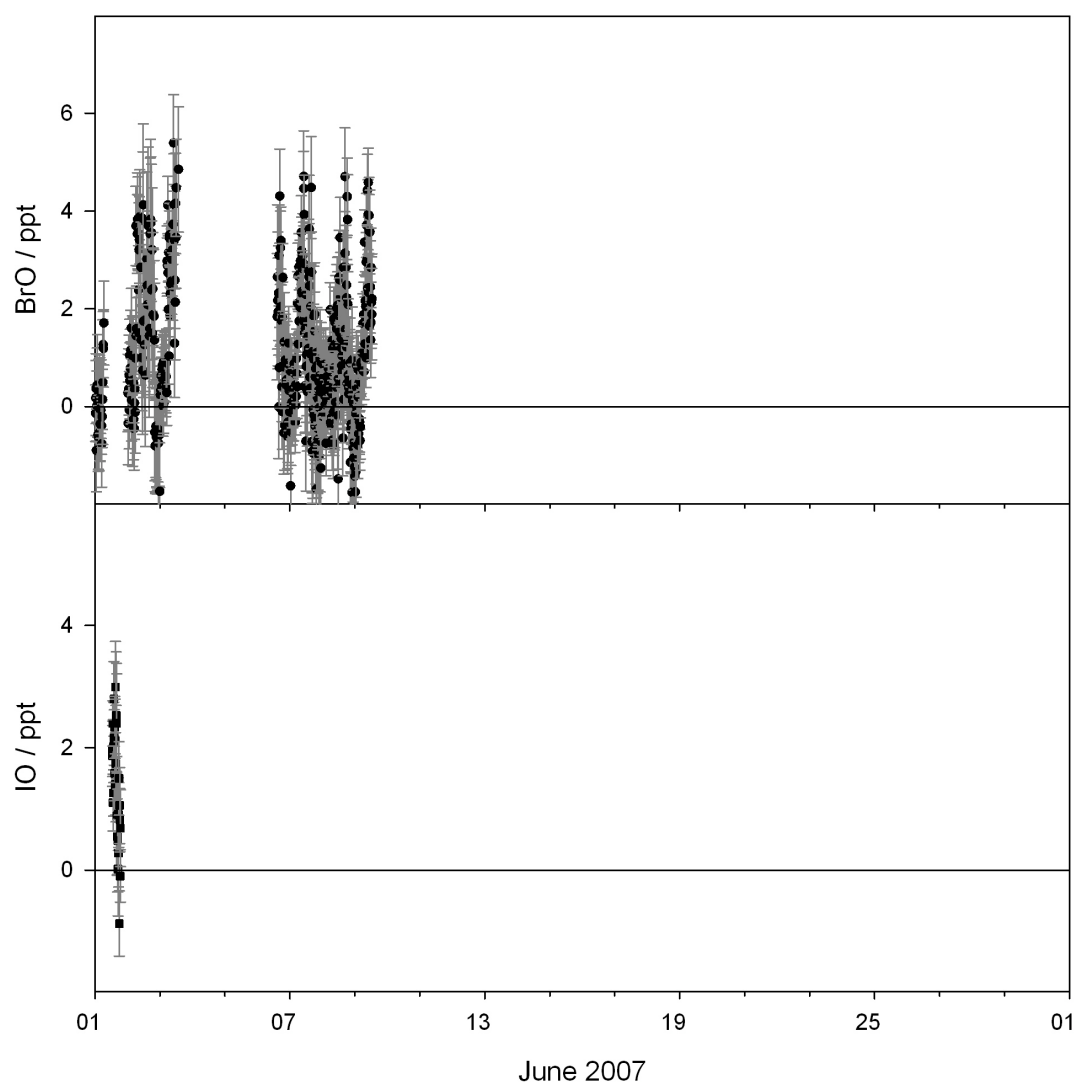
Figure S9: BrO and IO mixing ratios observed at Cape Verde during June 2007. The black circles indicate the BrO mixing ratio, black squares indicate the IO mixing ratio and the grey bars indicate the 2 sigma errors.
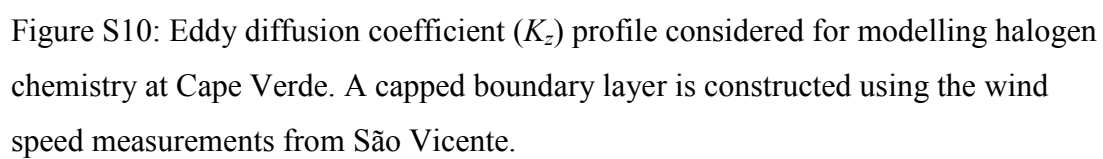
Figure S10: Eddy diffusion coefficient (K_z) profile considered for modelling halogen chemistry at Cape Verde. A capped boundary layer is constructed using the wind speed measurements from São Vicente.
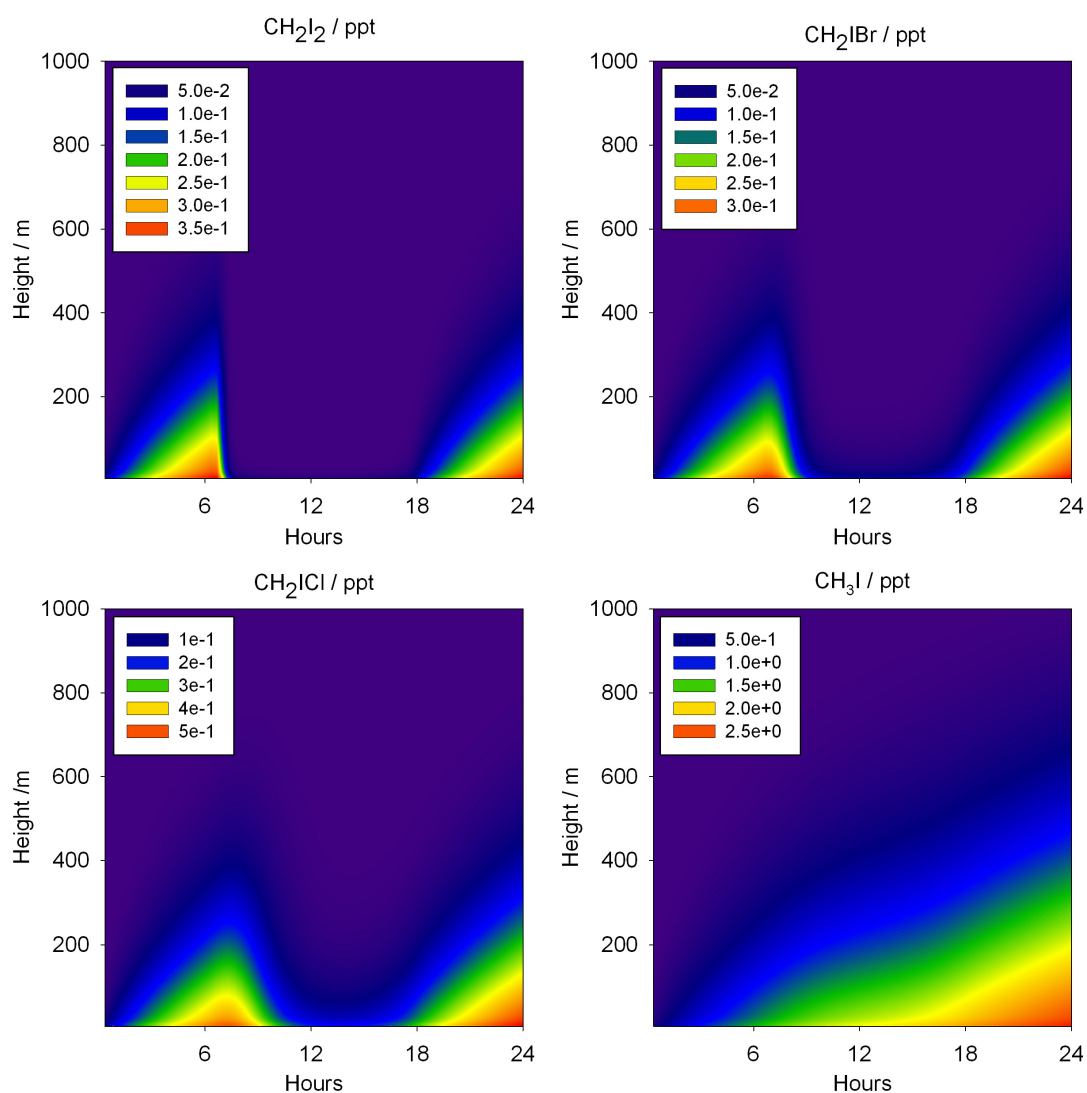
Figure S11: Predicted profiles of CH$_2$I$_2$, CH$_2$IBr, CH$_2$ICl and CH$_3$I at Cape Verde using halocarbon flux measurements (Jones et al, 2009) as constraints. The short lived photolabile iodocarbons (e.g. CH$_2$I$_2$ and CH$_2$IBr) show a strong diurnal trend with higher values seen during the night time. The longer lived species are better mixed in the BL (e.g. CH$_3$I).
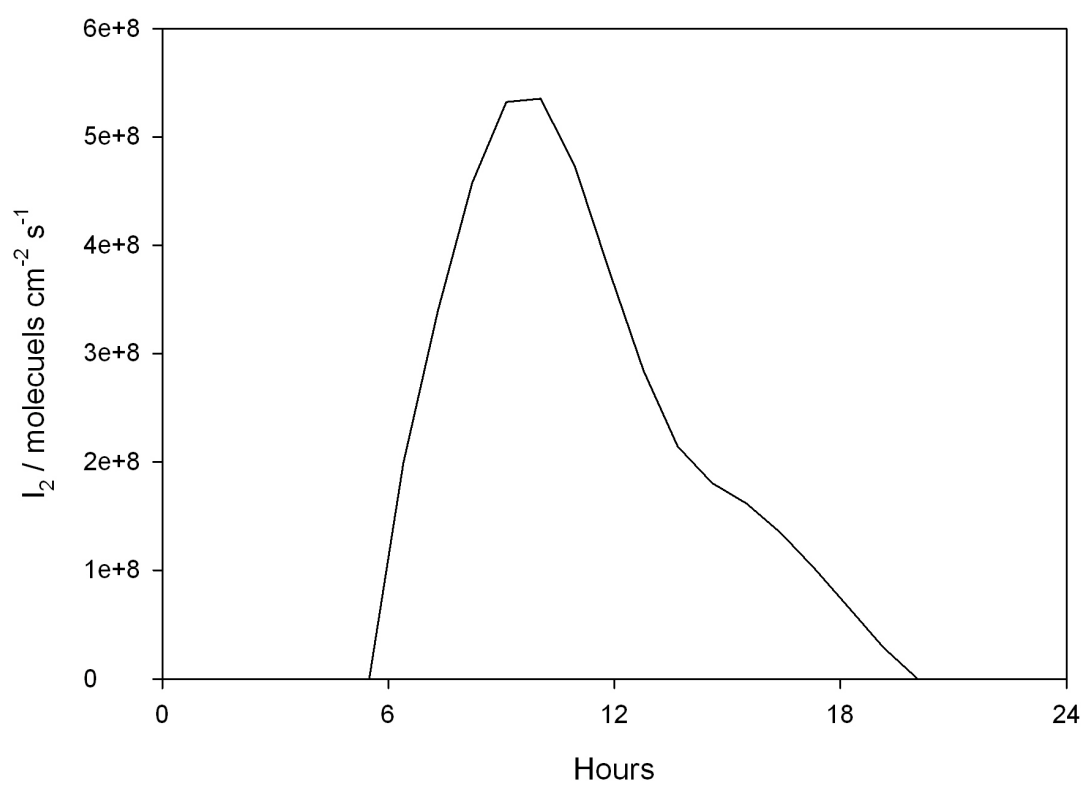
Figure S12: Diurnal profile of extra I_2 flux used in THAMO to get the best fit to IO observations at Cape Verde.