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Spectroscopical Determination of ground-level concentrations of Reactive Halogen Species (RHS) above salt lakes, salt pans and other areas with high halogen emissions

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Reactive Halogen Species (RHS), especially BrO and IO, are crucial for the photo chemistry of ozone, the oxidation capacity of the troposphere and have an impact on the equilibria of many atmospheric reaction cycles. This also induces a potential influence on the earth's climate.

Beside polar regions, volcanoes and the marine boundary layer salt lakes are an important source for reactive halogen species. At the Dead Sea BrO mixing ratios of up to 176 ppt were measured in summer 2001 [Matveev et al., 2001] and IO was identified with maximal mixing ratios of more than 10 ppt by [Zingler and Platt, 2005]. The Salar de Uyuni in Bolivia showed the presence of up to 20 ppt BrO [Hönninger et al., 2004]. Salt pans and salt deserts may be important halogen sources as well. Saline soils cover 2.5% of the land surface of the earth and might increase in the near future due to desertification as one aspect of the global climate change.

Within the scope of the DFG research group HALOPROC a measurement campaign in Southern Russia was performed in August 2009. The ground-level concentrations of BrO, IO, Ozone and other trace gases above the salt lakes El'Ton, Baskuntschak and other local areas were measured using the Multi-AXis-DOAS technique.

A further campaign was performed in Mauritania in November/December 2009 in cooperation with the BMBF project SOPRAN. In addition to the above-mentioned measurements the Long-Path DOAS technique was used in order to measure the ground-level concentrations at two different sites: 1. the salt pan Sebkha N'Dramcha and 2. close to a sea weed field at Poste Iwik in a coastal area.

We present results from both campaigns concerning the concentrations of bromine oxide (BrO), iodine oxide (IO), ozone (O3)and formaldehyde (HCHO) and give an outlook on possible further campaigns in the future.