



Modeling bromine chemistry in the lower boundary layer over the Dead Sea

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Measurements of Ozone and BrO concentrations over the Dead Sea indicate that Ozone Depletion Events widely known to happen in polar regions are also likely to occur over the Dead Sea due to the very high bromine content of Dead Sea water. However, BrO and ozone levels as they are detected can not solely be explained by high Br⁻ levels in the Dead Sea water and the release of gas phase halogen species out of sea borne aerosol particles and their conversion to reactive halogen species. It is likely that other sources for reactive halogen compounds are needed to explain the observed concentrations for BrO and ozone.

To explain the chemical mechanism taking place over the Dead Sea leading to BrO levels of several ppt we used the single column model MISTRA which calculates microphysics, meteorology, gas and aerosol phase chemistry. We performed pseudo Lagrangian studies by letting the model column first move over the desert which surrounds the Dead Sea region and then let it move over the Dead Sea itself. To include an additional source for gas phase halogen compounds gas exchange between the Dead Sea water and the atmosphere is treated explicitly. Model calculations indicate that this process has to be included to explain the measurements.