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Multiple Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) observations of Bromine Monoxide (BrO) and ozone over the ice in Arctic and Sub Arctic in the winter, spring and summer of 2008 and 2009

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Ozone is frequently nearly completely removed from the marine boundary layer in the Polar Regions during the spring time every year. Those spring-time boundary layer ozone depletion events (ODE) are driven by reactive bromine liberated from saline surfaces. ODEs are usually found to be associated with enhanced BrO in the troposphere. ODEs and elevated BrO values over Polar Regions were recorded at ground coastal observation stations, through satellite observations and during a limited number of intensive measurements conducted on board research marine based and aircraft platforms. Improvements of the measurements, retrieval precision and spatial and temporal coverage have been made over the years. However, many questions about the processes remain unanswered including initiation and recycling mechanisms, the role of different surfaces and meteorological conditions for bromine release and recycling, and their vertical extent. Out On The Ice (OOTI) is a fully automated observatory designed to measure BrO, ozone and gaseous elemental mercury along with meteorological parameters in the cold remote Arctic environment. It was developed under OASIS-Canada ("Ocean Atmosphere Sea Ice and Snow interactions in Polar regions") framework to study air-surface interactions right above the sea ice surface.

An overview of this work will be presented of the MAX-DOAS BrO and in-situ ozone measurements from four field campaigns selected for recurring elevated BrO values and frequent ozone depletion episodes. The characteristics of the surrounding surface and environmental variables such as temperature, solar radiation, winds speed and direction are combined with back trajectory analysis to improve our understanding on the factors affecting the presence and origin of BrO at specific locations.