



OASIS-CANADA: observations of boundary layer ozone and mercury depletion from the Arctic Ocean surface

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Dramatic depletion of ozone (O₃) and gaseous elementary mercury (GEM) from the marine boundary layer during the spring in Polar Regions is known to be driven by bromine atoms originating from activation of seasalt bromide. Almost all surface based measurements have been made at coastal observatories, but much of the active processing of the air is believed to occur near or at the surface of the Arctic Ocean itself. A major objective of the OASIS (Ocean Atmosphere Sea Ice and Snow) program during the International Polar Year (IPY) was therefore to make observations directly over the frozen Arctic Ocean.

In the context of the OASIS-CANADA program, sponsored by the Canadian Federal Program Office of the IPY, several ocean bound campaigns were joined including the French TARA expedition (2006-2008), the CFL campaign on the Canadian ice breaker CCGS Amundsen (February-April 2008), the COBRA campaign over the Hudson Bay near Kuujjuaraapik/Whapmagoostui, Quebec (February-March 2008), the ASCOS campaign on the Swedish polar class ice breaker Oden to the North Pole (August-September 2008), and the OASIS-09 campaign at Barrow Alaska (February-March 2009).

In this presentation I will summarize the observations and explore what has been learned regarding the drivers for the depletion process, such as the influence of the ambient temperature, the nature of the underlying surface, and the atmospheric stability. An important question is whether depletion in progress was observed, rather than the arrival of previously depleted air, as is generally the case at Arctic coastal observatories.