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**A connection between arctic haze and halogen chemistry?**

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It has long been known that the Arctic spring time exhibits a phenomenon known as “Arctic Haze”, characterized by low visibilities, caused by a relatively high concentration of fine aerosol. This aerosol is known to be composed largely of sulfate, with the precursor  $\text{SO}_2$  transported from anthropogenic sources regions in North America and Eurasia. However, since the original studies of Arctic Haze, a complex array of halogen chemistry (involving Cl, Br and I chemistry), initiated by chemistry and photochemistry on frozen saline surfaces and in sea salt aerosol, has been discovered. That halogen chemistry makes the Arctic boundary layer extremely oxidizing, with large concentrations of both halogen radicals and  $\text{HO}_x$ . That environment can lead to new particle production via oxidation of organic gas phase precursors and/or enhanced oxidation of  $\text{SO}_2$ . Recent observations of a rapidly changing surface in the Arctic raise questions about how this halogen chemistry, which also which results in massive scale depletion of ozone and mercury, will change in the future. In this talk I will discuss what is known about halogen chemistry in polar regions, how that ties to aerosol chemistry, and how these are impacted by climate change and changes in the nature of the frozen surface.