



Chemical Atmosphere-Snow-Sea Ice Interactions: defining future research in the field, lab and modeling

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The air-snow-sea ice system plays an important role in the global cycling of nitrogen, halogens, trace metals or carbon, including greenhouse gases (e.g. CO₂ air-sea flux), and therefore influences also climate. Its impact on atmospheric composition is illustrated for example by dramatic ozone and mercury depletion events which occur within or close to the sea ice zone (SIZ) mostly during polar spring and are catalysed by halogens released from SIZ ice, snow or aerosol. Recent field campaigns in the high Arctic (e.g. BROMEX, OASIS) and Antarctic (Weddell sea cruises) highlight the importance of snow on sea ice as a chemical reservoir and reactor, even during polar night. However, many processes, participating chemical species and their interactions are still poorly understood and/or lack any representation in current models. Furthermore, recent lab studies provide a lot of detail on the chemical environment and processes but need to be integrated much better to improve our understanding of a rapidly changing natural environment.

During a 3-day workshop held in Cambridge/UK in October 2013 more than 60 scientists from 15 countries who work on the physics, chemistry or biology of the atmosphere-snow-sea ice system discussed research status and challenges, which need to be addressed in the near future. In this presentation I will give a summary of the main research questions identified during this workshop as well as ways forward to answer them through a community-based interdisciplinary approach.