

Third workshop on Air-Ice Chemical Interactions (AICI)



Contribution ID: 2

Type: **not specified**

How different would tropospheric oxidation be over an ice-free Arctic?

Wednesday, 8 June 2011 14:15 (15 minutes)

Climate projections suggest that a complete Arctic sea-ice retreat is likely in the future during summer. Less ice will cause less light reflection and slower tropospheric photolysis. We use a tropospheric chemistry model to examine how oxidation may differ over an ice-free Arctic. We find that late-summer OH concentrations can decrease by 30–60% at polar latitudes, while effects on local ozone and global oxidant abundances are small. Ozone changes become larger in the more extreme case where sea-ice is also removed in spring and early summer. In this case, we find large spring ozone increases (up to 50–60%) over the Arctic, and even over inhabited high latitude regions (up to 20%), due mainly to a reduction in the impact of bromine chemistry, caused by the sea-ice retreat. Annual mean ozone also increases in the run with the summer/spring sea-ice removal, but not in the simulation including only late-summer sea-ice removal.

Please list some keywords

sea-ice retreat, photolysis rates, hydroxyl radical, bromine, tropospheric ozone

Primary author: Dr VOULGARAKIS, Apostolos (NASA Goddard Institute for Space Studies at Columbia University, New York, USA)

Co-authors: PYLE, John (NCAS–Climate, Centre for Atmospheric Science, Department of Chemistry, University of Cambridge, UK); Dr YANG, Xin (NCAS–Climate, Centre for Atmospheric Science, Department of Chemistry, University of Cambridge, UK)

Presenter: Dr VOULGARAKIS, Apostolos (NASA Goddard Institute for Space Studies at Columbia University, New York, USA)

Session Classification: Modeling Workshop