

## HitT – Climate impact of seasalt-derived Cl atoms

Chlorine is the most abundant halogen in Earth's crust, in ocean water, and in the atmosphere. Our knowledge about the atmospheric reaction cycles of *natural* chlorine in the troposphere is incomplete. Reactive chlorine contributes to tropospheric ozone cycling and to the acidity of atmospheric aerosols (as HCl), but the most global important impact of reactive chlorine may be as an oxidant for the greenhouse gas methane.

This workshop addressed the following overarching questions:

- 1) *Is tropospheric Cl chemistry a significant aspect of atmospheric reactivity, and to what extent is it a natural vs anthropogenic effect?*
- 2) *Do we have to include chlorine chemistry in future climate models to improve the calculation of the radiative forcing and if so, what level of process understanding is required?*

This workshop was organised by the SOLAS/IGAC task "Halogens in the Troposphere" ([www.HitT-task.net](http://www.HitT-task.net)) and was held in Kiel, Germany in December 2012 with financial support by SOLAS and IGAC. Of the 22 participants, 8 were early career scientists. A review of the current state-of-the-art of atmospheric Cl cycling was given on day 1 through scientific presentations by the participants and the following 2 days were used to discuss how to best address the two main questions.

Discussions revolved around uncertainties in our understanding of Cl cycling in terrestrial and marine environments, with a focus on:

- 1) Factors determining the formation of ClNO<sub>2</sub> in continental air, particularly the origin and transport of HCl.
- 2) Developing strategies to better constrain Cl atom levels in marine air, and understanding the discrepancies between observations and models, particularly with regard to BrCl.

The discussions highlighted the need for additional laboratory, instrumentation development, field studies and modelling, and it quickly became clear that all three approaches are required to accurately assess the climate impact of atmospheric chlorine. Several funded modelling projects are ongoing (e.g., at Leeds and Norwich) which are trying to produce a global picture of the relevance of chlorine chemistry and focussed field campaigns are being planned for Europe, North America, and a marine site (most likely on the Bermuda). Future progress will be assessed in focussed workshops as separate meetings or in conjunction with meetings such as the SOLAS Open Science conference.

Detailed minutes of the meeting can be found on the HitT web page.

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