## Project: 1128

## Project title: Investigation of the influence of air pollution on DMS and its role in the Earth's climate

## Principal investigator: Erik Hoffmann

Report period: 2021-11-01 to 2022-10-31

In the current allocation period, computing time has been granted for ECHAM-HAMMOZ simulations that focus on (i) the effect of incorporating new gas-phase chemistry findings into MOZ and how this changes the atmospheric oxidation budget and (ii) the effect of bush and savanna fires on the atmospheric composition and thus radiation budget.

Laboratory and theoretical work showed the formation of hydrotrioxides from the reaction of organic peroxyl radicals with the OH radical. This gas-phase chemistry findings were implemented into MOZ for the oxidation of isoprene that is the largest biogenic emitted volatile organic compound, A reaction sequence of  $RO_2$  radicals from isoprene oxidation by the OH radical were included to yield hydrotrioxides and further oxidise these.

After the implementation simulations were performed on Mistral that focus on the importance of this reaction sequence on global scale. For this purpose, the new reaction sequence has been compared to the currently included  $RO_2$  reactions. Globally, formation of up to 10 million metric tons of the hydrotrioxide is modelled.

The simulation results are part in the combined paper of Berndt et al. and published in the high-impact journal Science (doi: 10.1126/science.abn6012).

The simulation of the effect of bush and savanna fires on the atmosphere are planned to run on the new server Levante. Unfortunately, issues occurred for the compilation and running of the ECHAM-HAMMOZ model on Levante. These are currently not solved completely, but solution is expected on short time scale. Further simulations are planned in the next allocation period.