

Project: **893**

Project title: **Convection and Clouds in Earth System Modelling**

Principal investigator: **Holger Tost**

Report period: **2020-11-01 to 2021-08-31**

In the current allocation period, we did not manage to fulfill the anticipated work packages.

Only some computations have been performed for further model development and testing of the EMAC / MECO(n) model configurations (WP II) with respect to aerosol cloud interactions. This is especially true for direct aerosol radiation interactions, which showed some deficiencies in the current model configuration and forced us to re-write the code for aerosol radiation interactions. This work is currently ongoing, and will potentially be finished in the next month. An evaluation simulation using the new code is anticipated for the upcoming allocation period.

Furthermore, some simulations utilising a new ice scheme in ICON have been conducted in collaboration with the working group of Prof. Spichtinger from the Institute for Atmospheric Physics at the JGU in Mainz.

The activities utilising the ATHAM model (proposed WP I) have been delayed due to the COVID pandemic, such that we did not manage to perform any simulations at the DKRZ architecture. This happened mostly, as the time plans for this project have been too ambitious. Nevertheless, the model has been ported to DKRZ successfully and will potentially be used in the future.

Also the proposed WP III has not been tackled due to unforeseen simulation results which are still pending explanation. However, in our opinion it does not make sense to conduct many additional simulations before the current results are properly analysed, understood and interpreted.

The work in WP VI is ongoing, i.e. the data analysis and visualisation of aqueous phase chemistry. It is planned to be finalised by the end of the year, but again the pandemic took its toll to reduce the efficient working time of myself and the people involved in this analysis. An example of the impact of glyoxal and other low molecular weight organic compounds on the distribution of organic aerosols is depicted below. This study also addresses the role of the cloud phase as a reservoir for (organic) atmospheric compounds.

