EGU21-7406, updated on 29 Nov 2022
https://doi.org/10.5194/egusphere-egu21-7406
EGU General Assembly 2021


# Role of initial condition and parametric uncertainty in a severe hailstorm forecast

**Patrick Kuntze**[1], Annette Miltenberger[1], Corinna Hoose[2], and Michael Kunz[2]
[1]Johannes Gutenberg-University Mainz, Institute for Atmospheric Physics, Mainz, Germany (pkuntze@uni-mainz.de)
[2]Karlsruhe Institute of Technology (KIT), Institute of Meteorology and Climate Research, Karlsruhe, Germany

Forecasting high impact weather events is a major challenge for numerical weather prediction. Initial condition uncertainty plays a major role but so potentially do uncertainties arising from the representation of physical processes, e.g. cloud microphysics. In this project, we investigate the impact of these uncertainties for the forecast of cloud properties, precipitation and hail of a selected severe convective storm over South-Eastern Germany.
To investigate the joint impact of initial condition and parametric uncertainty a large ensemble including perturbed initial conditions and systematic variations in several cloud microphysical parameters is conducted with the ICON model (at 1 km grid-spacing). The comparison of the baseline, unperturbed simulation to satellite, radiosonde, and radar data shows that the model reproduces the key features of the storm and its evolution. In particular also substantial hail precipitation at the surface is predicted. Here, we will present first results including the simulation set-up, the evaluation of the baseline simulation, and the variability of hail forecasts from the ensemble simulation.
In a later stage of the project we aim to assess the relative contribution of the introduced model variations to changes in the microphysical evolution of the storm and to the fore- cast uncertainty in larger-scale meteorological conditions.