

Sensitivity of ice formation processes in the ice modes scheme

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Common microphysics bulk schemes only consider a single ice class which includes sources from multiple formation mechanisms. We developed and implemented a two-moment microphysics scheme in the atmosphere model ICON that distinguishes between different ice modes of origin including homogeneous nucleation, deposition freezing, immersion freezing, homogeneous freezing of water droplets and secondary ice production from rime splintering, frozen droplet shattering and collisional break-up, respectively.

Model assumptions, e.g. choice of nucleation parameterizations and representation of ice nucleating particles, affect crucially the time evolution of clouds in the simulations. Using our newly developed bulk scheme we can determine the contribution of the various ice formation mechanisms to the total ice content. We will present idealized studies of convective cases with a focus on the sensitivity of secondary ice mechanisms.