



## **HYMACS: A hybrid mass flux convection scheme for non-hydrostatic NWP models**

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Convection can cause severe precipitation events and is thus of major interest for quantitative precipitation forecast. Due to its small horizontal scale convection usually has to be parameterized in numerical weather prediction (NWP) models as a subgrid scale phenomenon. Classical mass flux convection schemes assume grid box sizes much larger than the scale of the convective circulation. Thus, the convective mass transport is closed in the local grid column and no net mass transport occurs on the grid scale. In contemporary NWP models with grid sizes of a few kilometers, where convection is partially resolved, this approach leads to a conceptual problem. We therefore propose a hybrid mass flux convection scheme (HYMACS), in which only the small scale convective up- and downdrafts are parameterized, whereas the treatment of the larger scale environmental subsidence is left to the grid scale equations. Different to the classical schemes, HYMACS produces a net convective mass flux exerting pressure gradient forces to the grid scale model.

We will discuss real cases of different meteorological situations simulated with the operational weather forecast model of the German Weather Service as the hosting model of HYMACS. Precipitation and other parameters simulated with HYMACS will be compared to results from classical convection schemes and observational data.