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# A comparison of warm-rain parameterisations using a new benchmarking tool for cloud microphysics

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In this paper we will briefly describe a newly implemented cloud model inspired by the kinematic framework of Szumowski et al. (1998, Atmos.Res. 45) and based on an MPDATA-type solver (Smolarkiewicz et al. 1998, J.Comp.Phys. 140). The model combines accurate numerics and a simplified fluid dynamical core (2D, prescribed-flow, decoupled from microphysics). It is well suited to serve as a computationally cheap and robust testbed for benchmarking and developing cloud microphysics-related retrieval algorithms as well as parameterisations of cloud processes for larger-scale and more sophisticated models.

To showcase the model features, including its modular structure, we will present a comparison of several warm-rain cloud microphysics schemes ranging from a single-moment bulk parameterisation to a particle-based formulation covering aerosol-cloud interactions.