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Exploring the consequences of nearest neighbour interaction in convective parametrisations

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The goal is to gain some insight into the possible consequences of explicit treatment of organisation within a NWP model with parameterised convection. To this end we formulate a nearest neighbour coupling between grid points to implement a convective trigger that shows sensitivity to its surrounding conditions. The philosophy is based on 2D Lattice models and is inspired by the work in Ref. [1]. We work with the global ICON model [2] at the operational grid point distance of thirteen kilometers. The implementation is rather ad hoc but is helpful to investigate the possible impacts on the structure of the precipitation field. In particular we compare to the storm-resolving simulation of the NARVAL case [3]. In addition we investigate the behaviour of the parametrisation over the maritime continent. It turns out, for example, that some organised structures that are lost within the standard parametrisation setup can be recovered with nearest neighbour coupling. We furthermore investigate whether the cold-pool diagnostics developed in [4] can serve as trigger for nearest neighbor interactions.

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