

How should we represent convective genesis?

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The GENESIS project aims to make a systematic study of boundary layer heterogeneity and its interaction with moist convection based on analysis of Large-Eddy Simulations. This work aims to provide measures of the scales of interaction relevant to triggering and maintaining convection which are traditionally unresolved in global circulation models. The project focuses on observed physical phenomena (shallow/deep convection, aggregated convection and coldpools) and how these interact with and influence structures in the boundary layer. The aim is to provide existing and new convection schemes with a statistical description of the forcing from below cloud base and through this aid the development of convection schemes with better representation of sub-grid variability. First results from novel analysis of length-scales in LES are presented. Novel analysis tools including methods borrowed from Direct Statistical Simulation (DSS) and topological visualisation are explored.

Statistical representations of the connection between cloud properties and the sub-cloud boundary layer feeding those clouds will be presented.