



## **Uncertainty in numerical modeling of deep moist convective processes: The role of microphysics**

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A proper understanding of microphysical phenomena is a key requirement to reduce uncertainty in the prediction of extreme hydrometeorological events. New generation ground based and spaceborne remote sensing techniques allow to observe these phenomena at unprecedented spatial and temporal resolutions. Along the lines, microphysics-based observational, theoretical and modeling studies are deserving a growing attention to gain a deeper understanding of the spatio-temporal variability of intense precipitation events. In this paper some recent research results achieved by the CIMA Foundation in this framework will be presented. The discussion will range from the formulation of a novel theory for deep moist convection, through the investigation of the joint effect of turbulence and microphysics parameterizations on the uncertainty in numerical modeling of deep moist convective processes, to the analysis of some observed extreme rainfall scenarios.