Plinius Conference Abstracts
Vol. 13, Plinius13-45, 2011
13th Plinius Conference on Mediterranean Storms

Precipitation in a boiling soup: is microphysics driving the statistical properties of intense turbulent convection?

A. Parodi (1), J. von Hardenberg (2), and A. Provenzale (2)

(1) CIMA Research Foundation, Savona, Italy, (2) Istituto di Scienze dell'Atmosfera e del Clima (ISAC), Consiglio Nazionale delle Ricerche, Torino, Italy

Intense precipitation events are often associated with strong convective phenomena in the atmosphere.
A deeper understanding of how microphysics affects the spatial and temporal variability of convective processes is relevant for many hydro-meteorological applications, such as the estimation of rainfall using remote sensing techniques and the ability to predict severe precipitation processes.
In this paper, high-resolution simulations (0.1-1 km) of an atmosphere in radiative-convective equilibrium are performed using the Weather Research and Forecasting (WRF) model by prescribing different microphysical parameterizations: from single-moment to triple-moment closures.
The dependence of fine-scale spatio-temporal properties of convective structures on microphysical details are investigated and the simulation results are compared with the known properties of radar maps of precipitation fields. We analyze and discuss similarities and differences and, based also on previous results on the dependence of precipitation statistics on the raindrop terminal velocity, try to draw some general inferences.