

Extreme precipitation scaling, rain cell sizes, and the role of cold pools, and their relation to climate change

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Dependencies of observed (sub)hourly rainfall on near surface dew point temperature show relations exceeding the Clausius-Clapeyron relation. Those so-called super CC scaling rates can be only sustained when sufficient moisture is provided to cloud systems by dynamical feedbacks. Large eddy simulation clearly show a tendency to produce large cloud structures under warmer conditions, and cold pool dynamics appear to play a key role in this process. Understanding the physics behind scaling rates, and the role of cloud feedbacks, is of utmost importance to estimate how precipitation extremes may change in future climate. In this presentation, I will discuss super CC scaling rates from surface and radar observations and convection permitting model simulations, and understanding from the recent large set of Large Eddy Simulation results under different climate conditions.

Authors: LENDERINK, Geert (KNMI and TUD); Mr LOCHBIHLER, Kai (KNMI and TUD); Prof. SIEBESMA, Pier (TUD and KNMI)

Presenter: LENDERINK, Geert (KNMI and TUD)

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