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Fine scale structures in rainfall patterns: high resolution radar observations of severe storm events.

H. Russchenberg, T. Otto, C. Unal, and Y. Dufournet
Delft University of Technology, TUDelft Climate Institute, Delft, The Netherlands, h.w.j.russchenberg@tudelft.nl

Operational weather radars often operate with a course spatial resolution in the order of 1 by 1 km. Details of the rainfall structure at scales smaller than that cannot be seen directly, while such details can lead to significant rainfall at the surface. Climate change can lead to an increased risk for extreme rainfall. To counteract the adverse effects of this, high-resolution forecasts of extreme rainfall – especially in urban areas – are needed. This is can only be achieved with a combination of high-resolution models and accurate high-resolution observations.

Recent developments in weather radar technology are resulting in a new generation of rainfall radars, operating at higher frequencies – 10 GHz – and higher spatial resolution: tens of meters have become feasible. At CESAR Observatory in The Netherlands such a radar is installed on the top of the 213 meter observation tower. It is capable of measuring a large range of rainfall rates with a resolution of 30 meter. It's maximum range is set to 15 kilometer to prevent interpretation errors due to the curvature of the Earth.

We aim at presenting the added value of such high resolution observations of rainfall in comparison with those performed by standard weather radars. More specifically, we will analyse two events with extreme rainfall and show the wealth of information that can be obtained from such observations, which can then be jointly used with weather models to forecast the location, timing and intensity of extreme rainfall.