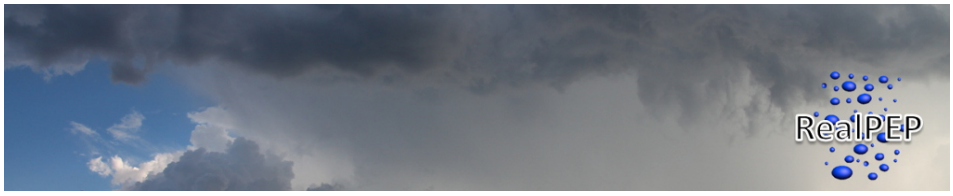

Contribution ID: **58** Type: **Oral presentation**

Foresight: Forecasting Storms with Insight

Tuesday, October 6, 2020 9:40 AM (20 minutes)

The ability to predict extreme rain and flooding over the next 6 hours is one of the major challenges facing meteorological services worldwide. Currently, two main approaches are available to forecasters: a) data-driven predictions based on the extrapolation of radar observations and b) physically-based numerical weather prediction models (NWPs). Radar-based forecasts offer high spatial resolutions and update times but lack the ability to anticipate crucial dynamic processes such as the growth of new rain cells or sudden changes in rain cell motion or intensity. Mesoscale numerical weather prediction models, on the other hand, are computationally more intensive and tend to have lower spatial resolution and accuracy than radar. However, because they include more physics, they are better at anticipating future changes in storm dynamics beyond a few hours.

In this talk, I propose a new approach to rainfall forecasting based on machine learning that combines the accuracy and speed of radar extrapolation techniques with the physical knowledge and contextual understanding of a numerical weather prediction model. The basic idea is to teach machine learning models to anticipate crucial changes in rain cell properties (e.g., size, motion, intensity, etc..) based on the coarse-scale guidance from a numerical weather prediction model. Different models and approaches are discussed and some real-life examples for heavy convective rain events in the Netherlands are shown.

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