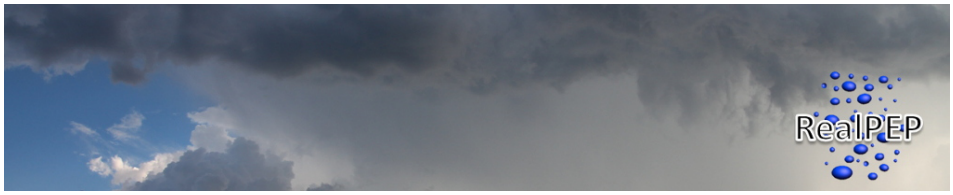

Contribution ID: **46** Type: **Oral presentation**

Evaluating NWP-based ensemble forecasts for distributed hydrological modelling and flash flood forecasting in France

Wednesday, October 7, 2020 9:00 AM (40 minutes)

Several efforts have been made to enhance our knowledge on how flash floods occur and to develop forecasting techniques that anticipate their impacts. Short-term ensemble forecasts have been considered crucial to assess forecast uncertainty and improve flood warning. This presentation focuses on the challenges of evaluating the performance of ensemble forecasts of flash floods. It is based on ongoing work carried out within the PICS national research project in France ("Towards integrated nowcasting of flash floods impacts"; https://pics.ifsttar.fr/). The project's goals is to develop and evaluate integrated short-range nowcasting chains that combine (i) high resolution quantitative precipitation estimates and short range (0-6h) precipitation forecasts, (ii) distributed rainfall-runoff models designed to simulate river discharges in gauged and ungauged conditions, (iii) DTM-based hydraulic models for the delineation of potentially flooded areas, and (iv) impacts models aiming to represent a range of socio-economic effects. After an overview of the PICS project, the presentation will focus on the evaluation of ensemble flood forecasts in the Aude River Basin in France. The GRSD semi-distributed hydrological model is first adapted to be flexible enough to simulate two key types of flood events observed in the study region: winter and spring floods, often occurring during or after wet periods, and autumn floods, often occurring after long and dry summer periods. It is then used to illustrate the performance of three ensemble precipitation forecast products recently developed by the French meteorological service (Météo-France) for the 14-15 October 2018 flood event. The three products are based on the ensemble forecasts from the AROME NWP model, on a combination of the AROME forecasts with nowcasting products, and on the introduction of perturbations to this combined forecast set. Precipitation forecasts up to six hours ahead are used to force the semi-distributed hydrological model at the hourly time step. The challenges of event-based ensemble forecast evaluation are discussed.

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Session Classification: Flash Flood Prediction