

## **Probabilistic hydrological nowcasting using radar based nowcasting techniques and distributed hydrological models**

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The exposure of the urban areas to flash-floods is particularly significant to Mediterranean coastal cities, generally densely-inhabited. Severe rainfall events often associated to intense and organized thunderstorms produced, during the last century, flash-floods and landslides. These events cause severe damages to urbanized areas on both the coastal-fluvial plains and surrounding slopes, and sometimes have caused human casualties. A large number of catchments flowing into the Mediterranean sea and passing through coastal cities are small (less than 100 km<sup>2</sup>) with a corresponding hydrologic response timescale in the order of a few hours.

A suitable nowcasting chain is essential for the on time forecast of this kind of events. This work aims to present the use of hydrological models coupled with nowcasting techniques. The nowcasting model PhaSt furnishes an ensemble of equi-probable future precipitation scenarios on time horizons of 1–3 h starting from the most recent radar observations. Coupling the output with hydrological distributed models it is possible to generate different discharge prediction for the following hours and associated return period maps: these maps can be used as a support in the decisional process for the warning system.