

# 國立中央大學大氣物理研究所書報討論

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## **A methodological framework for the evaluation of short-range flash-flood hydrometeorological forecasts at the event scale**

### **ABSTRACT**

Flash floods contribute in a significant proportion to flood-related damage in the Mediterranean countries. This paper introduces a methodological framework for evaluating short-range hydrometeorological ensemble forecasts in the context of intense flash-flood events, particularly those characterized by high spatiotemporal variability. Customized for regional-scale evacuation and rescue operations, the approach prioritizes anticipating and precisely locating local exceedances of discharge thresholds. The process begins with the evaluation of rainfall forecasts. Subsequent stages involve predicting the flood-rising limb in numerous ungauged sub-catchments and conducting a detailed evaluation in selected gauges. The framework's application to the October 2018 flash flood in the Aude River basin utilizes three ensemble rainfall nowcasting products, revealing their strengths but also highlighting tendencies for spatial overestimation.

In the evaluation results, especially when considering larger ensemble percentiles, the tested products demonstrate efficacy in identifying regions of significant rainfall. However, spatial overestimation is noted, and the hydrological evaluation indicates improved localization and anticipation of discharge threshold exceedances. Despite the challenges associated with a limited number of documented flood events and the resulting statistical constraints, this proposed evaluation framework contributes valuable insights into the effectiveness and limitations of newly developed rainfall forecast ensembles for flash-flood forecasting purposes, providing a basis for further refinement and enhancement.

### **Keywords**

Anticipation time

10 year discharge return period

### **Reference**

Charpentier-Noyer, M., Peredo, D., Fleury, A., Marchal, H., Bouttier, F., Gaume, E., Nicolle, P., Payrastre, O., and Ramos, M.-H.: A methodological framework for the evaluation of short-range flash-flood hydrometeorological forecasts at the event scale, *Nat. Hazards Earth Syst. Sci.*, **23**, 2001–2029