



## **A hydro-meteorological approach for Probabilistic Flood Forecast**

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We propose a new methodology for evaluating predictive Cumulative Distribution Functions (CDF) of ground effects for flood forecasting in mountainous environments. The methodology is based on the proper nesting of models suitable for probabilistic meteorological forecast, downscaling of rainfall and hydrological modelling in order to provide a probabilistic prediction of ground effects of heavy rainfall events. Different ways of nesting are defined as function of the ratio between three typical scales: scales at which rainfall processes are satisfactory represented by meteorological models; scales of the hydrological processes; scales of the social response. Two different examples of the application of the methodology for different hydrological scales are presented. Predictive CDFs are evaluated and the motivations that lead to a different paths for CDFs derivation are highlighted.