



## **The effect of orography on extreme rainfall: a simplified meteo-morphological model**

R. Tropeano (1), **P. Furcolo** (2), D. Guida (2), F. Rossi (2), P. Villani (2)

1) C.E.R.I.U.S., Centro di Eccellenza per il Rischio Idro-geologico dell'Università di Salerno, Penta di Fisciano (SA), Italia, (2) Dipartimento di Ingegneria Civile, Università degli Studi di Salerno, Fisciano (SA), Italia. (p.furcolo@unisa.it)

Orographic barriers generally produce high variability in the rainfall field, which can be even more relevant when extreme rainfall is considered. It has been observed that the usual, linear geostatistical techniques for spatial interpolation fail in correctly interpreting such variability, because of the stationarity hypothesis (Furcolo et al., EGU 2004). This work represents a first step in the modelling of the drift induced by the presence of orographic barriers over extreme rainfall, with reference to a study area in Southern Italy. This area is characterized by a relatively simply interpretable interaction between the Apennines Mountains and the wet air masses, usually moving along the SW-NE direction. We worked with the mean of the annual maxima of daily rainfall, a statistical parameter that effectively reproduces the main features of the recurring extreme events (Furcolo et al., EGU 2004). Using a simplified orography, and keeping into account the dominant direction of the storms, it was possible to classify different areas depending on their morphology. We found a relation between extreme rainfall intensity in these areas and their morphological features, with a conceptual link to simple meteorological models. The proposed model allows for a better spatial estimation of the rainfall field, especially in areas where the orographic effect cannot be properly captured by the hydro-meteorological network. As a result, we expect an improvement in the understanding and in the early-warning of some catastrophic phenomena, like, for example, flash pyroclastic debris floods.