

Phenomenological interpretation of the frequency distribution of annual rainfall maxima in the mediterranean region

Antonio Parodi

Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Cadorna, 7 - 17100 Savona, Italy.

Giorgio Boni

Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Cadorna, 7 - 17100 Savona, Italy.

Franco Siccardi¹

Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Cadorna, 7 - 17100 Savona, Italy.

Abstract. Any regional rainfall frequency analysis needs for the definition of a theoretical frequency distribution that can be assumed as parent distribution for the analyzed variable. In Italy many investigations have been done in order to identify the best form of the parent distribution in terms of capabilities of reproducing the statistical properties of the observed time series. The TCEV distribution applied to Italian hydrological data has been demonstrated to be able to take into account both for the observed presence of outliers and high variability of the skewness. Furthermore its parameters have a clear physical meaning. Despite of this good properties of TCEV no satisfactory explanation of the physical reasons that produces the presence of two components in observed rainfall distribution has been given so far. The aim of this work is to provide a phenomenological validation of the experimental evidences on the observed data. The experimental evidence of the Mediterranean storm characteristics provided by remote sensing can give the elements for this validation. It is shown that using a simple model for storm simulation to generate synthetic time series, the different characteristics of the two kind of storms, especially in terms of advection speed, can produce the two components in time series frequency distribution and reproduce some other global characteristics of the time series.

¹ Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Cadorna, 7 - 17100 Savona, Italy.

Tel: + 39 - 019 230271

Fax + 39 - 019 862612

e-mail: franco@idra.unige.it