



## **Applying a probabilistic model of rainfall and snow days occurrence to daily series recorded in NW Italy.**

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Daily precipitation records exist spanning several decades. A valuable amount of climatic information exists in the time-series of interarrival times (IT), defined as the succession of times (number of days) elapsed from a rainy (or snowy) day to the one immediately preceding it. In a previous work, Agnese et al. (2014) have been successfully tested some probabilistic modelling of rain occurrence on Sicily rainfall data; particularly, the better fitting of IT's observed frequencies was obtained by 3-parameter Lerch-series distribution. In this work this distribution is tested on 70 years of 20 precipitation time-series taken in the North-West Italy, both in the plain and in the mountains, up to the 2000 meters altitude.

In such Mediterranean climate two markedly different behaviours were observed in the dry semester (April to September) and in the wet one (October to March). A better fit was obtained with that simple subdivision of the year, in comparison with the whole year modelling. However, the NW Italy climate is both more similar to the Central Europe one, and it is deeply influenced by the higher peaks of the Alps. Therefore the seasonality of daily precipitation data is much more complicated. Usually spring and fall are the seasons characterized by the higher precipitations, but the convective vs. frontal events also play a role in the IT distributions. In this work, different subdivisions were compared with the whole year fitting. The whole year Lerch distributions successfully fitted the data in a part of the time series, opening the way to interesting climate applications.

Agnese C., Baiamonte G., Cammalleri C. Modelling the occurrence of rainy days under a typical Mediterranean climate. *Advances in Water Resources*, 2014, accepted (available online 2 January 2014).