Statistical and scaling laws for river discharges: a case study from mainland Portugal

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Engineering studies often rely on the available data and knowledge of river discharge and/or rainfall-runoff modelling. Because river discharge time series are only available for a limited number of reference sections, the study of the hydrologic regime of many natural water ways is often inhibited. Consequently, use is made of the knowledge existing for other sections of the same or other rivers in the region. Because extrapolations often fail, there has been almost a continued search for new approaches that could serve engineering design and applications better.

This study reports results from the characterization of the statistical behaviour of river discharges observed at different scales, which is often done making use of a variety of statistical models. These results are compared with the statistical characterization of the same processes using scale invariant approaches: (i.e. looking for a statistical behaviour holding across scales). The data used in this study are river discharges from Mainland Portugal.