



New insights on the multifractal nature of river networks

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Studies on principles governing the organization of river networks are of significant importance in both estimating the basin hydrological response and understanding a river system morphodynamics. In the last decades the introduction of the fractal geometry has allowed a synthetic analysis of the river network geomorphology independently of the observation scale. This work aims to provide new outcomes on the multifractal nature of river networks. A river network is often schematized as a deterministic fractal tree generated by recursive algorithm and characterized by links of variable length. In such cases, the generalized fractal dimensions are estimated using the properties of self-similar sets. Here, the river network is still assumed as a self-similar fractal object but with self-similar measures. Based on this assumption, the multifractal spectra of 10 river basins in southern Italy were computed. The regular shape of these spectra would confirm the self-similarity conjecture, while the different amplitudes would demonstrate a certain dependence on geological and/or climatic constraints.