**To improve the use of Entropy theory for flow monitoring in gauged and ungauged river sites**

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**Abstract:**

In river monitoring, it is quite difficult to sample velocity points during high floods, especially in the lower portion of flow area, due to the danger that operators might face during measurement. In this context an important contribution is provided by the entropy theory which identified a linear relationship between the mean flow velocity and the maximum flow velocity which can be easily sampled also during high floods for its position in the upper portion of the flow area. The entropic relationship is robust and is based on the estimation of a sole parameter M. which is considered as constant for a considered river (Chiu,1995), it is more useful than usual hydraulics characteristics like Manning roughness which changes in large intervals for a unique river.

Several works were conducted on the use of this method , using the gauge data to obtain the entropic parameter M which gives a direct relationship between mean and Maximum velocity , but few works were oriented to toward the use of this method for ungauged river sites, which is very useful to improve the river monitoring network, especially if we can use remote sensing for river flow measurements.

In the present work, we used experimental device to show that the entropic parameter became constant for rough channels and that for several discharges and slopes, that results confirm that entropic parameter can be considered as the hydraulic identity parameter of the river. Also using more Algerian (coastal Algiers and Cheliff watersheds) and Italian (Tiber river basin) gauge data, we obtained local models to determine the entropic parameter using basin characteristics, and we developed a global model which is of great importance for ungauged basins, or to check, sometimes, the accuracy of the gauge data obtained in some gauge stations.

Keywords: Entropy, river monitoring, Algiers watershed, Tiber river.