Geomorphology-based rainfall-runoff models are particularly helpful in the frame of hydrological prediction in ungauged basin. The approach robustness, generality and flexibility make it able to deal with a large diversity of processes, events and scales. It allows to propose a non-calibrated rainfall-runoff transfer function for any basin without the need of discharge measurement.

The aim of this study is to transpose hydrological observations from gauged to ungauged basins, in order to simulate streamflow hydrographs. It considers pairs of nested and neighbouring basins, the first one providing knowledge and data for the second target one. A discharge series of the providing basin is deconvoluted, through the inversion of its geomorphology-based transfer function, to assess the excess rainfall series. The latter is then transposed to the target basin where it can be reconvoluted with its own transfer function to simulate the hydrograph therein.

A first promising run of this methodology was tested with simulated rainfall-runoff events in semiarid Tunisian basins. In the present work, the methodology is implemented with real rainfall-runoff events, on a set of nested basins in humid Brittany, France. We introduce an improvement of the transposition, through the accounting for space-time variability: i) firstly, of rainfall, in a robust and flexible manner, according to changing available raingauging configurations; ii) secondly, of geographic main features in order to satisfy the differences between the providing and the target basins.