



Improvements of LSPIV method and implementation in Fudaa-LSPIV software

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Constant progresses in microelectronics and computer science democratized the utilization of cameras in our everyday's life. From that point, cameras turn to be a simple and easy-to-use measuring instrument for hydrometric purposes. Indeed, they allow the determination of instantaneous surface velocity field on wild open-channel flows. The so called LSPIV for Large-Scale Particle Image Velocimetry is one of the first method that has been proposed to face natural conditions in riverine environments, and it is now broadly used for research or engineering purposes. Years of developments leads to a standardized process proposed in the Fudaa-LSPIV software. This paper aims to emphasize the ongoing effort carried out to improve LSPIV. Several ameliorations on Fudaa-LSPIV software will be shown for improving the quality of the velocity computations and to facilitate the use of the software and avoid user setup errors. Our paper describes improvements related to

- video extraction : special attention is given on the subsampling of the video keeping a constant interval time between images
- image registration : LSPIV images encompass the river, which is a moving object. Image registration should only rely on points of interest located on the banks of the river,
- ortho-rectification of the scene : Fudaa-LSPIV allows using a complete 2D or /3D orthorectification using ground control points, or just scaling from known distances for drone-based measurements)
- improvements on the robustness of the calculation using properties of the correlation field.

The presentation will be illustrated by a real case study to let the audience discover the new Fudaa-LSPIV version.