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Field Data Collection Methods and Data Processing of the Influence of Low Momentum Ratio and the Rate of Sediment Transport Forcing on Confluence Hydrodynamics, Morphodynamics and Mixing

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River confluences are zones where two or more rivers join and form a single channel downstream of their junction. Because of their essential role in the dynamic of fluvial networks, there has been an increase in the attention given to their hydrodynamics and morphodynamics during last three decades. Despite this increased understanding of the complex flow behavior and morphological aspects, few studies has been focused on low momentum ratio river confluences and mixing processes. As among these few studies, most of them have been driven by the mean of laboratory experiments and numerical models, a combination of field data collection and data processing is required to study the effect of low momentum ratio on flow dynamic, rive morphology and rate of mixing in river confluences.

In the present poster, the flow discharge and velocity data of two upper Rhône river confluences in Switzerland, which are characterized by low momentum ratio and a varied rate of poorly sorted sediment transport is shown. The data set is mostly collected, using spatial distributed acoustic Doppler current profiling (aDcp) measurements. The morphological changes are studied using a combination of high-resolution aerial imagery data obtained by a phantom drone and acoustic bathymetric surveys. The mixing processes are investigated by measuring the surface water temperature with a thermic camera mounted on an E-bee drone [, whereas sediment pathways can be explored through the use of the ‘bottom-tracking’ feature of the aDcp device (not sure there will be such results at the conference time)].

These collected data is processed using a matlab code, Pix4D and visualization software. These processed data then can be used to describe the flow behavior, morphological aspects and mixing processes at river confluences characterized by low momentum ratio and to test laboratory derived conceptual models of flow processes at such junctions. The obtained results can be used under a wider range of forcing conditions to provide detailed data on the three-dimensional flow field and the morphology, to validate numerical models.