



## Variation of the flow field over the scour hole

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Local scour next to hydraulic structures is a common occurrence resulting from the interaction of the local flow field with the erodible riverbed. Scour depth estimation is the basis for the hydraulic design of bridges, water intakes, flow diversion and similar structures as well as their scour countermeasures. The focus of this study is the experimental investigation of the variation of the flow field over the scour hole formed next to the bridge pier protected with riprap sloping structure. Clear water scour experiments were conducted in the hydraulic flume for as single flow rate close to the incipient motion condition. The experiment was run for 20 hours, with bathymetry and flow data measurement 2h, 6h, 10h, and 20h from the start of the experiment. During the experiment, the development of the scour hole has initiated deposition of the eroded material, evolving into bedforms over the downstream bed. The flow data was measured using the ADVP in the near-bed region on 15 points, arranged into the rectangular 5x3 grid, covering the entire scour hole and part of the surrounding riverbed. The measured data was analyzed through flow velocity, Reynolds shear stress, and turbulent kinetic energy pattern for different elevations over the riverbed. The results show that exists a relationship between the scour hole development and the Reynolds shear stress pattern, indicating the direction in which the eroded material is being transported from the scour hole.

**Acknowledgements:** This work has been funded in part by the Croatian Science Foundation under the project R3PEAT (UIP-2019-04-4046).