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CFD modelling of Po River morphodynamics affected by bridge piers

Michael Nones (1), Massimo Guerrero (2), Nils Ruther (3), and Sandor Baranya (4)

(1) Interdepartmental Centre for Industrial Research in Building and Construction, Fluid Dynamics Unit, University of Bologna, Bologna, Italy (michael.nones@unibo.it), (2) Department of Civil, Chemical, Environmental, and Materials Engineering, University of Bologna, Bologna, Italy, (massimo.guerrero@unibo.it), (3) Department of Hydraulic and Environmental Engineering,Norwegian University of Science and Technology, Trondheim, Norway (nils.ruther@ntnu.no), (4) Faculty of Civil Engineering, Budapest University of Technology and Economics, Budapest, Hungary, (baranya.sandor@epito.bme.hu)

The paper presents the numerical modelling of the hydromorphological evolution of a 10-km reach of the Po River close to Ostiglia in Italy, affected by the presence of a railway bridge. The 3D simulation is performed using the freely available code SSIIM, developed at the University of Science and Technology in Trondheim in Norway. The domain consists of an unstructured grid with rectangular meshes having a dimension of 50x50 meters, with a nested detailed grid (5x5 m) around the piers. Preliminary results show the capability of the model in reproducing the behaviour of the reach, both in terms of liquid flow and morphodynamics, if compared with historical data measured along this watercourse. For the future, as a part of the Italian national project INFRASAFE, additional simulations will be performed to calibrate the model, changing the analyzed domain and used grids, and imposing, as boundary conditions, new data measured directly on the field with traditional and innovative techniques.