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Large-eddy simulation of the flow over a hydrokinetic turbine mounted on an erodible bed[1] XIAOLEI YANG, ALI KHOSRONEJAD, St. Anthony Falls Laboratory, College of Science and Engineering, University of Minnesota, FOTIS SOTIROPOULOS, St. Anthony Falls Laboratory, College of Science and Engineering, Department of Civil Engineering, University of Minnesota — Marine and hydrokinetic (MHK) energy comprises an important source of clean and renewable energy. The beds of natural waterways are usually erodible. The hydrokinetic turbines affect the sediment transport, which, on the other hand, also influences the performance of hydrokinetic turbines. A powerful computational framework for simulating marine and hydrokinetic (MHK) turbine arrays mounted in complex river bathymetry with sediment transport has been developed and validated by our group. In this work we apply this method to simulate the turbulent flow over a hydrokinetic turbine mounted in an open channel with erodible bed. Preliminary results show qualitatively good agreement with the experiment. Detailed comparison with measurements and analysis of the simulation results will be presented in the conference.

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