

Abstract Submitted  
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**LES of the flow field around a 45 ° wing-wall abutment in different scour conditions** FILIPPO BRESSAN, VINCENZO ARMENIO, DICA - Università di Trieste, FRANCESCO BALLIO, DIAR - Politecnico di Milano — Scouring process around bridge abutment is one of the main causes leading to the hydraulic structure failure, thus the determination of the maximum scour depth assumes a central role. Resolved LES of the turbulent flow field around a 45 ° wing wall abutment are carried out for three main scouring conditions: Initial phase (flat bed), logarithmic phase of scouring and equilibrium scour depth. The bathymetry and the flow parameters are taken from data of a laboratory experiment. Mean flow field, secondary flows and turbulent quantities such as Reynolds stresses and turbulent kinetic energy are calculated and compared for the three cases. The purpose of this study is to understand how the statistics of the wall stresses change with the increase of the scour depth. Preliminary results indicate that the bottom stresses decrease as the scour hole increases and that the bed deforms itself in order to minimize the effect of the obstacle on the Bernoulli trinomial. The results of this research will help in finding new erosion models based on the knowledge of turbulence-bed interaction.

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