

Three-dimensional hydrodynamic model of concrete tetrahedral frame revetments^(PDF)

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Title: Three-dimensional hydrodynamic model of concrete tetrahedral frame revetments

作者: 高柱; 李星; 唐洪武; 顾正华

Author(s): LI Xing²; TANG Hong-wu³; GU Zheng-hua

1. College of Civil & Hydroelectric Engineering, China Three Gorges University, Yichang 443002, China
2. Ningbo Huitong Engineering Construction Co.Ltd, Ningbo 315000, China
3. College of Water Conservancy and Hydropower Engineering, Hohai University, Nanjing 210098, China
4. College of Civil Engineering and Architecture, Zhejiang University, Hangzhou 310058, China

关键词: [concrete frame tetrahedrons](#); [numerical simulation](#); [drag](#); [lift](#)

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摘要: Revetments of concrete frame tetrahedrons are being used more and more in river engineering in China. Due to their complex geometry, it is difficult to measure the velocity fields inside them using traditional measurement methods. This limits understanding of their mechanics, potentially leading to suboptimal solutions. A 3-D hydrodynamic model based on the commercial computational fluid dynamics (CFD) code, Fluent, was developed to predict velocity fields and drags. The realizable $k-\epsilon$ model was adopted for turbulent closure of the Reynolds averaged Navier Stokes (RANS) equations. The study demonstrates that the numerical model can effectively supplement experimental studies in understanding the complex flow fields and mechanics of concrete frame tetrahedron revetments. Graphs showing the drag coefficient C_D versus Reynolds number Re and lift coefficient C_L versus Reynolds number Re were produced.

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