Computational Fluid Dynamics Analysis of Ship Entry to Locks

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ABSTRACT

A computational fluid dynamics (CFD) analysis is presented of ship entry to locks. Locks are a critical part of the shipping infrastructure enabling passage between oceans, rivers and canals. The prediction of hydrodynamic forces and rigid body motions during the approach and entry phase is required to inform the design and operation of locks, and nautical training. It has thus far relied on expensive and laborious experiments with physical models. The present study provides an assessment of the reliability of CFD to predict forces, motions and free surface dynamics based on the comparison to model tests with a typical inland waterway ship entering a typical inland waterway lock.