NUMERICAL INVESTIGATION OF WATER SLAMMING LOADS ON WAVE-PIERCING CATAMARAN HULL MODEL

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SUMMARY

With the increasing demand for faster and lighter ferries the need for predicting motions and sea loads for efficient structural design and safe operation has become necessary. Operation at speeds of around 40 knots in the open ocean, where water impacts can result in structural damage and crew injuries emphasises the need for the development of reliable tools to accurately predict slam loads.

This work investigated the behaviour of a quasi-2D section model of wave-piercing catamaran fitted with a centrebow during the impact phase using finite-volume Computational Fluid Dynamics (CFD), overlapping grids, Reynolds-Averaged Navier-Stokes (RANS) equations and Volume of Fluid (VOF) method to solve the water-entry problem. The computed vertical acceleration and slamming pressures are compared to previously published drop test experimental data and show good agreement. It was found that taking into account the compressibility of the trapped air is necessary to accurately predict slamming pressures.