

Abstract Submitted  
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**SPH simulations of helicopter ditching on calm water and in waves.** GUILLAUME OGER, ALBAN VERGNAUD, BENJAMIN BOUSCASSE, Ecole Centrale Nantes, SVERIN HALBOUT, Airbus Helicopters, ECOLE CENTRALE NANTES COLLABORATION, AIRBUS HELICOPTERS COLLABORATION — During helicopter ditching events, an Emergency Floatation System (EFS) is deployed prior to the impact so that to improve the occupants' chances of survival by keeping the helicopter afloat for a sufficiently long duration. However, predicting the helicopter behavior (equipped with its EFS) during the impact is not straightforward, especially in presence of waves. Thanks to the European H2020 project SARAH, experiments were performed in the wave tank of Ecole Centrale Nantes in partnership with Airbus Helicopters, providing reference results for comparison with CFD solvers. During this experimental campaign, a large set of helicopter impact cases with and without waves were tested. The Smoothed Particle Hydrodynamics (SPH) method appeared as a good candidate for such numerical simulations, due to its meshless and Lagrangian features together with its ability to deal with complex geometries in interaction with strong free surface deformations. In the present study, simulations are performed for various impact configurations and different wave conditions. The numerical solutions are systematically compared with the experimental results, especially regarding the trajectories, impact forces and local pressures.

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