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AN IMMERSED BOUNDARY METHOD FOR FLUID-RIGID BODY INTERACTION

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In this work, an immersed boundary method for the simulation of the interaction between flexibly supported rigid bodies and incompressible fluid flow is proposed. The strategy is based on a least-squares finite element method for the fluid flow, which is formulated on adaptive hierarchical B-spline grids. The interface traction force is represented by fluid body forces, which are concentrated along the interface by means of Dirac delta functions. An iterative strategy is employed for the resolution of the strong coupling. Numerical examples for lock-in and galloping are presented and the efficiency of h- and p-refinement is assessed.