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RESIDUAL-BASED VARIATIONAL MULTISCALE SIMULATIONS OF RISERS WITH PASSIVE VIV REDUCTION DEVICES

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Risers are one of the main devices in the Oil and Gas for offshore production. Subject to intense sea currents, they can suffer high hydrodynamics loading and Vortex-induced vibrations (VIV). Both mechanical phenomena increase the risk of a material fatigue, promoting serious damage to the structure, ultimately causing a production interruption. To avoid this unwanted damage scenario, different strategies have been applied by the O&G industry to reduce such vibrations (VIV). One of those strategies, classified as passive VIV suppressors, consists of attaching helical strakes to the riser surface. To evaluate the efficiency of the strakes addition becomes mandatory to estimate and predict the drag and lift. Complementary to experimental investigations, for example [1, 2], numerical simulations are nowadays successful tools to explore such challenges. In this work we use our in-house incompressible flow solver, EdgeCFD [3, 4], a hybrid MPI+OpenMP parallel edge-based implementation of the residual-based variational multiscale method (RB-VMS), an implicit LES turbulence modeling, to study the influence of different helical strakes configurations in the drag and lift, validated with available experimental data.

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