



Contribution ID: 144

Type: Paper

Numerical investigation of 2D Vortex Induced and Wake Induced Vibrations of two circular cylinders in tandem arrangement

Wednesday, 20 June 2018 14:00 (15 minutes)

In ocean and offshore engineering, Vortex and Wake Induced Vibrations (VIV, WIV) are serious issues related to the design and operational safety of offshore installations/structures.

Vortex Induced Vibrations occur when vortices shed by a blunt freely-moving structure in steady (or unsteady) flow induce an oscillatory force on the structure, mostly in the direction perpendicular to the ambient flow. WIV take place when the oscillatory wake shed on the leeside of a structures hits a secondary element of the structure, inducing an oscillatory force on the latter.

VIV of a single elastically-mounted 2D cylinder has already been investigated by the authors and here used as reference case.

In this work, the crossflow motion of two elastically-mounted 1-DOF 2D cylinders in tandem arrangement is investigated via CFD URANS-based simulations. Two relevant cases are presented, the first one in which the upwind cylinder is fixed and the downwind cylinder is free to move and the second one where both are free to move.

Considering the strong complexity of the phenomena involved in WIV, the results are in close agreement with experimental data, allowing a close insight in the coupling between wake and cylinder motion.

Primary author: Mr MARTINI, Simone (University of Trieste)

Co-authors: Prof. CONTENTO, Giorgio (Dept. of Engineering and Architecture - University of Trieste); Dr MORGUT, Mitja (Università degli Studi di Trieste); Mr PIGAZZINI, Riccardo (University of Trieste); Mr PUZZER, Thomas (University of Trieste)

Presenter: Mr MARTINI, Simone (University of Trieste)

Session Classification: Hydrodynamics

Track Classification: Numerical & experimental hydrodynamics