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Vortex-induced Oscillations and Heat Transfer on a Cylinder in Accelerated Flow VALENTINA KUDINOVA, Dnepropetrovsk National University (DNU), Ukraine, PAVEL KUDINOV, Royal Institute of Technology (KTH), Sweden — We propose a new method for solving aeroelasticity problems that combines numerical treatment of the Navier-Stokes equations with analytical solution of the dynamics equations on each time step. The numerical-analytical algorithm developed enables a systematic study of otherwise computationally-expensive fluid-structure interaction problems that span over a large time interval. Of both theoretical and practical interest is the effect of flow acceleration on aeroelastic oscillations and heat transfer at low Reynolds numbers. The present numerical work predicts several oscillation modes in a lower range of a dimensionless acceleration parameter A_F, whereas the oscillation modes diminish as A_F increases. The paper also discusses interesting heat transfer behaviour predicted to occur at low A_F in the resonant lock-in regime.

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