Flat Plate

Unsteady Lift

Vortex of strength Γ = -0.02 started upstream at (-4.5,0.04). Graph below shows comparison of obtained results to the analytical lift response of a flat plate to a passing vortex. Note that the lift for both analytical and numerical results have been 'normalized' by the strength of the vortex Γ and the exponential factor relating to the height of the vortex above the airfoil.

$$L = \rho\Gamma\frac{c}{2}e^{-kh}\big(-iS\big(k\big)\big) \tag{1}$$