鈍い物体まわりの流れのシミュレーションとそれに働く力

Simulation of a Flow around a Bluff Body and the Force

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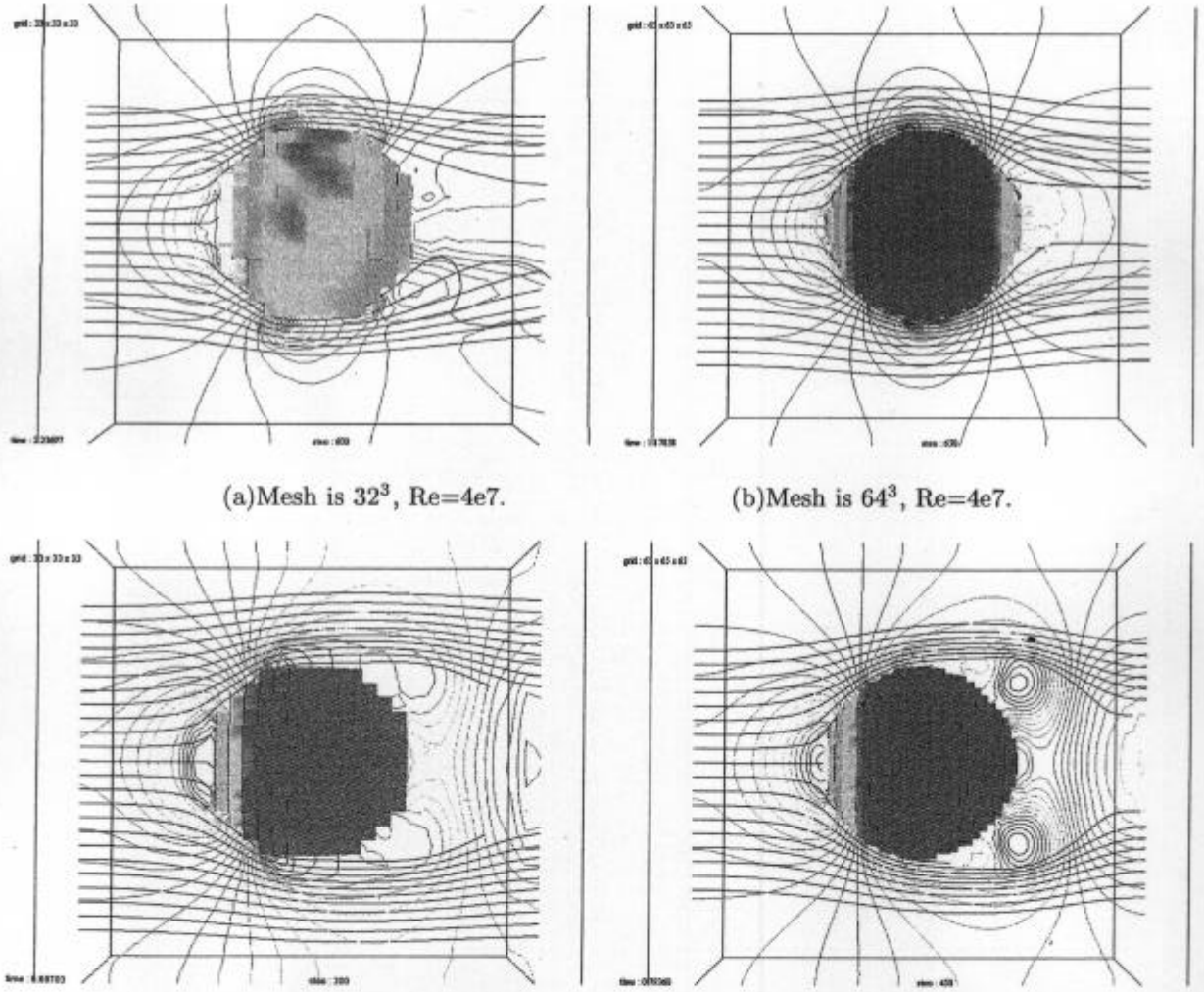
Impulsively-started flow past a bluff body is simulated by solving the unsteady incompressible Navier-Stokes equations with Cartesian grid system. The multi-directional finite-difference method with third-order upwinding is employed without using any turbulence model. As a result of computations at Reynolds numbers 0.1 – 40,000,000 the separation and the transition to turbulence are investigated in the wake and computed drag coefficients agree well with the experimental values. Also, drag crisis is captured.

鈍頭物体周りの流れとして, 球体周りの流れを計算した. Fig.1(a) ～ (c) にレイノルズ数および格子の違いによる等圧力線図と流線の変化をしめす.



(a)Mesh is 32^3, Re=4e7.

(b)Mesh is 64^3, Re=4e7.

(c)Mesh is 32^3, Re=4e4.

(d)Mesh is 64^3, Re=4e4.

Fig. 1: Pressure contours and stream lines around spheres.

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