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**Mathematical and numerical study of nonlinear problems in fluid mechanics.** (English)

[Zbl 0633.76025](#)

Differential equations and their applications, Equadiff. 6, Proc. 6th Int. Conf., Brno/Czech. 1985, Lect. Notes Math. 1192, 3-16 (1986).

[For the entire collection see [Zbl 0595.00009](#).]

The study of flow problems in their generality is very difficult since real flows are three-dimensional, nonstationary, viscous with large Reynolds numbers, rotational, turbulent, sometimes also more-fase and in regions with a complicated geometry. Therefore, we use simplified, usually two-dimensional and non-viscous models. (The effects of viscosity are taken into account additionally on the basis of the boundary layer theory.) Here we give a survey of results obtained in the study of boundary value problems describing two-dimensional, non-viscous, stationary or quasistationary incompressible or subsonic compressible flows with the use of a stream function.

**MSC:**

- [76D05](#) Navier-Stokes equations for incompressible viscous fluids
- [76G25](#) General aerodynamics and subsonic flows
- [35Q30](#) Navier-Stokes equations
- [65N30](#) Finite element, Rayleigh-Ritz and Galerkin methods for boundary value problems involving PDEs

Cited in **2** Documents

**Keywords:**

[stream function formulation](#); [stream function-finite element solution](#); [subsonic compressible flows](#)

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