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On a method for computing steady plane viscous motion in multiply- connected domains.

(English) [Zbl 0714.76039](#)

Bull. Pol. Acad. Sci., Tech. Sci. 37, No. 3-4, 173-182 (1989).

Summary: A new method for determination of steady plane motion of incompressible viscous liquid in multiply-connected domains is presented. The method is based on integration of a quasi-linear fourth-order equation for the stream function, as well as on conformal mapping of a multiply-connected original domain onto a multiply-connected region bounded by circles. The transformed problem governed by the equation for the stream function is solved by means of an analytically-numerical method, the stream function being assumed in form of suitable series in functions relating to a generalization of the Goursat formula. Determination of the unknown coefficients of the series is reduced to a system of linear equations, resulting from the boundary conditions, as well as from collocation conditions at fixed points of the domain of solution.

MSC:

[76D10](#) Boundary-layer theory, separation and reattachment, higher-order effects

[35Q30](#) Navier-Stokes equations

Cited in **2** Reviews

Keywords:

steady plane motion; incompressible viscous liquid; multiply-connected domains; quasi-linear fourth-order equation for the stream function; Goursat formula