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The solution of elliptic equations with periodic data for zone electrophoresis problem. (Russian. English summary) [Zbl 1402.76092](#)

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Summary: The hodograph method based on the conservation laws used for construct of implicit form solution for a system of first order quasilinear elliptic equations. These equations describe the model of zone electrophoresis. We construct the Riemann-Green function which allows us to obtain the solution in implicit form. Analytical-numerical method for recovery of an explicit solution on the level lines implicit solutions is proposed. This method is based on the construction of the Cauchy problem for systems of ordinary differential equations whose solution allows us to obtain an explicit solution in parametric form for the original problem. Examples of solutions with a variety of periodic data is studied.

MSC:

76M25 Other numerical methods (fluid mechanics) (MSC2010)

65L10 Numerical solution of boundary value problems involving ordinary differential equations

76R10 Free convection

Keywords:

quasilinear elliptic equations; spatially periodic initial data; hodograph method; zonal electrophoresis