NECESSARY CONDITIONS FOR THE EXISTENCE OF PSEUDOVERTICES OF THE BOUNDARY SET IN THE DIRICHLET PROBLEM FOR THE EIKONAL EQUATION

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The problem of the appearance of nonsmooth singularities in generalized solutions of first-order PDEs is studied. The Dirichlet boundary value problem is considered for an eikonal-type equation. The subject of the research is pseudovertices of the boundary set. Pseudovertices are useful for the analytic and numerical construction of branches of the singular set, i.e., the set where the solution of the boundary value problem is nonsmooth. Necessary conditions for the existence of pseudovertices are obtained in the case when a nonconvex boundary set has smooth boundary. The conditions are written in terms of constant curvature and constant coordinate functions defining the boundary of the set.

Keywords: first-order PDE, minimax solution, wavefront, diffeomorphism, eikonal, optimal result function, singular set, symmetry.

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