

**ON THE CONNECTION OF THE HAMILTON–JACOBI EQUATION WITH  
SOME SYSTEMS OF QUASILINEAR EQUATIONS**

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We show that the Hamilton–Jacobi equation with some conditions on the Hamiltonian can be associated with a quasilinear system of equations of the first order, which can be reduced to the vector Hopf equation. We find relations between the system of Riemann invariants and a specially constructed Hamilton–Jacobi equation. The result is illustrated with examples of a system of isentropic gas dynamics equations and a system of equations of chromatography. It is shown that the method of stochastic perturbations along characteristics allows to associate with the Hamilton–Jacobi equation a system of conservation laws.

Keywords: Hamilton–Jacobi equation, Hopf equation, system of Riemann invariants, viscous regularization, stochastic regularization.

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