

Weak Asymptotics Method and the Problem of Nonlinear Waves Interaction

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We consider PDE's with a small parameter and nonlinearities such that the equations have exact soliton-type or kink-type (smoothed shock waves) solutions. The main problem under consideration is a description of the scenario of the nonlinear waves interaction. We obtain an answer constructing uniform in time asymptotics and using the weak asymptotics method as a main tool. The main examples are non integrable versions of the KdV and sine-Gordon equations and the gas dynamics system.