

The inverse scattering method for the Davey-Stewartson equation

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The inverse scattering method is arguably the most powerful method for solving integrable non-linear partial differential equations. Some examples of the implementation of this technique will be presented in this talk. We will discuss the 1+1 dimensional case at the example of the Korteweg-de Vries equation describing waves on shallow water, and a generalization of this method to the 2+1 dimensional case for the Davey-Stewartson equation, which appears in hydrodynamics and nonlinear optics. Whereas the case of one spatial dimension leads to a so-called Riemann-Hilbert problem, in two spatial dimensions a so-called 'dbar problem' has to be solved.