1089-35-347 **Matti Lassas** and **Jennifer L Mueller*** (mueller@math.colostate.edu), Department of Mathematics, Colorado State University, Fort Collins, CO 80523, and **Samuli Siltanen**, **Andreas Stahel** and **Ryan Croke**. *Numerical solution of the Novikov-Veselov equation by the ISM and transverse instability of plane-wave soliton solutions.*

The Novikov-Veselov (NV) equation is a dispersive (2+1)-dimensional nonlinear evolution equation generalizing the (1+1)-dimensional KdV equation. Here, the inverse scattering method is used as a computational tool for computing evolutions of the NV equation. Evolutions of conductivity-type initial data computed by the inverse scattering method are compared to to those computed using a semi-implicit method using finite differences in the spatial variables, Crank-Nicolson in time, and fast Fourier transforms for the auxiliary equation. The two methods and are observed to coincide with significant accuracy. In addition, we prove instability of plane wave soliton solutions of the NV equation to transverse perturbations. To investigate the behavior of the perturbations, a hybrid semi-implicit/spectral numerical scheme was developed, applicable to other nonlinear PDE systems. Numerical simulations of the evolution of transversely perturbed plane wave solutions and multisoliton solutions are presented. (Received February 18, 2013)