Meeting: 1004, Bowling Green, Kentucky, SS 12A, Special Session on Partial Differential Equations and Their Applications

1004-35-246 **Michael Dobranski*** (m.dobranski@moreheadstate.edu), Department of Mathematics & Computer Science, Morehead State University, Morehead, KY 40351. *Continuous dependence of the scattering data on the compactly-supported potential for the Schrödinger equation,* $(\Delta + q)u - 0$, *in* $\mathbb{R}^2$.

In developing a scattering theory for partial differential equations in $\mathbb{R}^2$, it is often convenient to change to complex notation and consider the complex derivatives $\partial_{\bar{x}}$ and ∂_x of complex-valued functions of complex variables. The techniques, originated by Beals and Coifman, used to study these systems have been applied to problems such as the conductivity problem in $\mathbb{R}^2$, by deriving a first order system related to the conductivity equation, $\nabla \cdot (\gamma \nabla u) = 0$. We apply these techniques to the homogeneous Schrödinger equation, $(\Delta + q)u = 0$ in $\mathbb{R}^2$ with q compactly supported, by deriving a first order system related to this Schrödinger equation. The first order system we derive involves a nonlocal potential. We construct solutions to the system and the Schrödinger equation, develop a scattering theory, and use the scattering theory to show the continuous dependence of the scattering data on the potential. (Received January 25, 2005)