
Second Winner



Project Title:

One-Dimensional Inverse Scattering
and Spectral Problems

Researcher:

Professor Alexander Ramm

Country:

USA

University:

Kansas State University

Professor Alexander Ramm, the full professor of Kansas State University, distinguished graduate Faculty Award (1997) and elected member of the Electromagnetics Academy, MIT, (1990) has already published 423 papers in the international journals and has got two US patents.

In his present project, Professor Ramm, worked on Inverse Scattering Problems as one of the most important issues in Integral Differential Equations.

The classical results are often presented in a new way. Several highlights of the new results include: analysis of the invertibility of the steps in the Gelfand-Levitan and Marchenko inversion procedures; theory of the inverse problem with I-function as the data and its application; proof of the property C for ordinary differential operators, inverse problems with incomplete data; spherically symmetric inverse scattering problem with fixed-energy data: analysis of the Newton-Sabatier (NS) scheme for inversion of fixed-energy phase shifts is given. This analysis shows that the NS scheme is fundamentally wrong, and is not a valid inversion method; complete presentation of the Krein inverse scattering theory is given. Consistency of this theory is proved; Quarkonium systems; a study of the properties of I-function; some new inverse problems for the heat and wave equations are studied; and finally a study of inverse scattering problem for an inhomogeneous Schrodinger equation.