

**Aktosun, Tuncay**

**Inverse Schrödinger scattering on the line with partial knowledge of the potential.** (English)

Zbl 0844.34016

SIAM J. Appl. Math. 56, No. 1, 219-231 (1996).

The one-dimensional Schrödinger equation  $\psi''(k, x) + k^2\psi(k, x) = Q(x)\psi(k, x)$ ,  $x \in \mathbb{R}$  is considered. It is proved that the potential  $Q(x)$  in  $L_1^1(\mathbb{R})$  is uniquely determined by the scattering data including its reflection coefficient from the right (left) and the knowledge of this potential on the right (left) half line. Neither the bound state energies nor the bound state norming constants are needed to determine  $Q(x)$ . As an example  $Q(x)$  is constructed from the scattering data consisting of the bound state energies, the knowledge of the potential on a set of nonzero measure, and either of the reflection coefficients. Two inverse scattering problems for a generalized Schrödinger equation  $\psi''(k, x) + k^2H(x)^2\psi(k, x) = Q(x)\psi(k, x)$  when the potential to be recovered is partially known are also studied.

Reviewer: V.Burjan (Praha)

**MSC:**

[34A55](#) Inverse problems involving ordinary differential equations

[81U40](#) Inverse scattering problems in quantum theory

Cited in **1** Review  
Cited in **10** Documents

**Keywords:**

inverse scattering problems; one-dimensional Schrödinger equation; scattering data; reflection coefficient

**Full Text:** [DOI](#)