The $\bar{\partial}$- approach to approximate inverse scattering at fixed energy in three dimensions.

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Abstract:
We develop the $\bar{\partial}$- approach to inverse scattering at fixed energy in dimension $d \geq 3$ of [Beals, Coifman 1985] and [Henkin, Novikov 1987]. As a result we propose a stable method for nonlinear approximate finding a potential $v$ from its scattering amplitude $f$ at fixed energy $E > 0$ in dimension $d = 3$. In particular, in three dimensions we stably reconstruct $n$-times smooth potential $v$ with sufficient decay at infinity, $n > 3$, from its scattering amplitude $f$ at fixed energy $E$ up to $O(E^{-(n-3-\varepsilon)/2})$ in the uniform norm as $E \to +\infty$ for any fixed arbitrary small $\varepsilon > 0$ (that is with almost the same decay rate of the error for $E \to +\infty$ as in the linearized case near zero potential).

This talk is based on [R.G. Novikov, International Mathematics Research Papers 2005].