

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

**R.G.Novikov**

Université de Nantes

**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 up to  $O(E^{-(n-3-\varepsilon)/2})$  in the uniform norm as  $E \rightarrow +\infty$  for any fixed arbitrary small  $\varepsilon > 0$  (that is with almost the same decay rate of the error for  $E \rightarrow +\infty$  as in the linearized case near zero potential).

This talk is based, mainly, on [R.G.Novikov, International Mathematics Research Papers 2005 :6, 287-349 (2005)].