Scattering Theory for Higher Order Differential Operators with Sparse Random Potentials

**Mahmoud-Sabry Saif, Ahmad M. Abdeltawab
and Usama M. Abdelsalam**[1]

Mathematics Department, Faculty of Science
Fayoum University, Fayoum 63514, Egypt

Abstract

In this paper, the scattering theory is studied for a pair of self-adjoint operators H_0, elliptic operators of high order, in the space $L_2(\Re^d)$ and $H = H_0 + V_\omega(x)$ with $V_\omega(x)$, decaying random potential on $\Re^d, d \geq 3$. We prove the existence and completeness of the wave operators $W_\pm(H, H_0)$ and the coincidence of the essential spectra of the operators H_0 and H.

Mathematics Subject Classification: Primary: 34L05, 47A40, Secondary 47B80

Keywords: Wave operators, spectral theory, partial differential operators, random potentials

1 Introduction

In the present paper we study the scattering theory for a model in perturbation theory, in particular, the existence and completeness of the wave operators $W_\pm(H, H_0)$, where the Hamiltonian H is a sum of the elliptic operator of high order

$$H_0 = \sum_{|\alpha|,|\beta| \leq m} (-1)^{|\alpha|} D^\alpha (b_{\alpha\beta}(x) D^\beta)$$

in the space $L_2(\Re^d)$ as a self-adjoint operator and of ,$V_\omega(x)$, a random potential on $\Re^d$ such that the function

$$U(x) = E(V_\omega(x))$$

---

[1]maths_us@hotmail.com