ON THE QUADRATIC BUNDLES RELATED TO HERMITIAN SYMMETRIC SPACES

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Abstract. Here we develop the direct scattering problem for quadratic bundles associated to Hermitian symmetric spaces. We adapt the dressing method for quadratic bundles which allows us to find special solutions to multicomponent derivative Schrödinger equation for instance. The latter is an infinite dimensional Hamiltonian system possessing infinite number of integrals of motion. We demonstrate how one can derive them by block diagonalization of the corresponding Lax pair.

Contents

1. Introduction

The modern period in the history of integrable systems started with the discovery of the inverse scattering transform (IST) by Gardner, Greene, Kruskal and Miura [7] who solved the Cauchy problem for the Korteweg-de Vries equation. Ever since that time the applications of IST increased tremendously – from purely discrete equations to multidimensional partial differential equations [1, 22].