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NONLOCAL COMPLEX MODIFIED KORTEWEG-DE VRIES EQUATIONS: REDUCTIONS AND EXACT SOLUTIONS

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Abstract. We present three different two-dimensional nonlocal integrable cmKdV equations obtained by Ablowitz-Musslimani type of reductions which are respectively T-symmetric, S-symmetric, and ST-symmetric nonlocal cmKdV equations. Ablowiz - Musslimani type of reduction arises from remarkably simple symmetry reductions of general AKNS scattering problems where the nonlocality appears in both space and time or time alone. Moreover, we obtain exact solutions by Darboux transformation.

1. Introduction

Integrable models play an exceptional role in the study of nonlinear wave propagation. There are many physically important integrable equations such as the nonlinear Schrodinger equation, the Korteweg-de Vries equation, the Kadomtsev-Petviashvili equation, the Davey-Stewartson equation. Most of those integrable equations are local equations, it means that the solution's evolution depends only on the local solution value and its local space and time derivatives [4, 7, 8, 10]. In 2013 Ablowitz and Musslimani introduced the nonlocal nonlinear Schrodinger equation and obtain its exact solutions by inverse scattering [1]. After that, a lot of works were done for this equation and other equations [2, 3, 5, 6, 9].