

Some Coherent Excitations for the (2+1)-Dimensional Generalized Broer-Kaup System

Zheng-Yi Ma^{a,b}, Yu-Lu Liu^a, and Zhi-Ming Lu^a

^a Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University,
Shanghai 200072, P. R. China

^b College of Science, Zhejiang Lishui University, Zhejiang Lishui 323000, P. R. China

Reprint requests to Prof. Z.-M. L.; E-mail: ZMLU@STAFF.SHU.EDU.CN

Z. Naturforsch. **61a**, 116 – 124 (2006); received February 13, 2006

Using a projective Riccati equation, several types of solutions of the (2+1)-dimensional generalized Broer-Kaup system are obtained, including multiple soliton solutions, periodic soliton solutions and Weierstrass function solutions. From these, two sets of wave packets are expressed as rational functions of elliptic functions. Especially, peculiar wave patterns that are localized in one direction but periodic in the other direction arise by taking the long wave length limit in one spatial variable. Also exponentially localized wave patterns, which differ from the known dromions, are obtained by taking the long wave length limit in both spatial variables. The interactions of two dromions with inelastic and elastic behaviors are presented.

Key words: Generalized Broer-Kaup System; Projective Riccati Equation; Coherent Excitation; Dromion.