

Fractal Dromion, Fractal Lump, and Multiple Peakon Excitations in a New (2+1)-Dimensional Long Dispersive Wave System

ZHENG Chun-Long,^{1,2,3,4} ZHU Jia-Min,¹ ZHANG Jie-Fang,^{2,3} and CHEN Li-Qun²

¹ Department of Physics, Zhejiang Lishui Normal College, Lishui 323000, China

² Shanghai Institute of Mathematics and Mechanics, Shanghai University, Shanghai 200072, China

³ Institute of Nonlinear Physics, Zhejiang Normal University, Jinhua 321004, China

⁴ Department of Physics, Zhejiang University, Hangzhou 310027, China

(Received: 2002-6-25; Revised: 2002-8-26)

Abstract: By means of variable separation approach, quite a general excitation of the new (2+1)-dimensional long dispersive wave system: $\lambda q_t + q_{xx} - 2q \int (qr)_x dy = 0$, $\lambda r_t - r_{xx} + 2r \int (qr)_x dy = 0$, is derived. Some types of the usual localized excitations such as dromions, lumps, rings, and oscillating soliton excitations can be easily constructed by selecting the arbitrary functions appropriately. Besides these usual localized structures, some new localized excitations like fractal-dromion, fractal-lump, and multi-peakon excitations of this new system are found by selecting appropriate functions.

PACS: 03.40.Kf, 02.30.Jr, 03.65.Ge

Key words: variable separation approach, new (2+1)-dimensional long dispersive wave system, fractal localized structure, peakon excitation

[\[Full text: PDF\]](#)

Close