New Exact Solutions and Fractal Localized Structures for the (2+1)-Dimensional Boiti-Leon-Pempinelli System

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In this work, a novel phenomenon that localized coherent structures of a (2+1)-dimensional physical model possess fractal properties is discussed. To clarify this interesting phenomenon, we take the (2+1)-dimensional Boiti-Leon-Pempinelli (BLP) system as a concrete example. First, with the help of an extended mapping approach, a new type of variable separation solution with two arbitrary functions is derived. Based on the derived solitary wave excitation, we reveal some special regular fractal and stochastic fractal solitons in the (2+1)-dimensional BLP system. — PACS: 05.45.Yv, 03.65.Ge

Key words: Extended Mapping Approach; Boiti-Leon-Pempinelli System; Fractal Soliton.