Painlevé Integrability and Abundant Localized Structures of (2+1)-dimensional Higher Order Broer-Kaup System

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It is proven that the (2+1) dimensional higher-order Broer-Kaup system the possesses the Painlevé property, using the Weiss-Tabor-Carnevale method and Kruskal’s simplification. Abundant localized coherent structures are obtained by using the standard truncated Painlevé expansion and the variable separation method. Fractal dromion solutions and multi-peakon structures are discussed. The interactions of three peakons are investigated. The interactions among the peakons are not elastic; they interchange their shapes but there is no phase shift.

\textit{Key words:} Painlevé Analysis; Variable Separation Method; Fractal Dromion Solution; Peakon Structure.