

(1+1)-Dimensional Turbulent and Chaotic Systems Reduced from (2+1)-Dimensional Lax Integrable Dispersive Long Wave Equation

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Abstract: After generalizing the Clarkson-Kruskal direct similarity reduction ansatz, one can obtain various new types of reduction equations. Especially, some lower-dimensional turbulent systems or chaotic systems may be obtained from the general form of the similarity reductions of a higher-dimensional Lax integrable model. Furthermore, an arbitrary three-order quasi-linear equation, which includes the Korteweg de-Vries Burgers equation and the general Lorenz equation as two special cases, has been obtained from the reductions of the (2+1)-dimensional dispersive long wave equation system. Some types of periodic and chaotic solutions of the system are also discussed.

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Key words: (2+1)-dimensional dispersive long wave equation, chaotic solutions

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