Evidence for the Nonintegrability of a Water Wave Equation in 2+1 Dimensions

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Z. Naturforsch. **59a,** 640 – 644 (2004); received June 9, 2004

We provide evidence of the nonintegrability of a recently proposed model for water waves in $2+1$ dimensions: we show that under a nonlinear time transformation, a certain reduction of this partial differential equation is mapped to an ordinary differential equation which does not have the Painlevé property. This is in contrast to what happens in the case of the Camassa-Holm equation. Also, and again in contrast to the case of the Camassa-Holm equation, the equation under study fails to admit Dirichlet series solutions. – MSC2000 classification scheme numbers: 35Q51, 35Q58, 37K10.

Key words: Nonintegrability; Similarity Reductions.