

Symmetry Reduction, Exact Solutions, and Conservation Laws of the (2+1)-Dimensional Dispersive Long Wave Equations

Zhong Zhou Dong^a and Yong Chen^{a,b}

^a Shanghai Key Laboratory of Trustworthy Computing, East China Normal University,
Shanghai 200062, China

^b Nonlinear Science Center and Department of Mathematics, Ningbo University, Ningbo 315211,
China

Reprint requests to Y. C.; E-mail: ychen@sei.ecnu.edu.cn

Z. Naturforsch. **64a**, 597 – 603 (2009); received November 8, 2008 / revised December 17, 2008

By means of the generalized direct method, we investigate the (2+1)-dimensional dispersive long wave equations. A relationship is constructed between the new solutions and the old ones and we obtain the full symmetry group of the (2+1)-dimensional dispersive long wave equations, which includes the Lie point symmetry group \mathcal{S} and the discrete groups \mathcal{D} . Some new forms of solutions are obtained by selecting the form of the arbitrary functions, based on their relationship. We also find an infinite number of conservation laws of the (2+1)-dimensional dispersive long wave equations.

Key words: Dispersive Long Wave Equations; Generalized Direct Method; Explicit Solution; Conservation Laws.

PACS numbers: 02.20.-a, 02.30.Jr, 04.20.Jb, 11.30.-j