

Accepted Manuscript

Orbital stability of solitary waves for generalized Boussinesq equation with two nonlinear terms

Weiguo Zhang, Xiang Li, Shaowei Li, Xu Chen

PII: S1007-5704(17)30406-9
DOI: [10.1016/j.cnsns.2017.11.018](https://doi.org/10.1016/j.cnsns.2017.11.018)
Reference: CNSNS 4375



To appear in: *Communications in Nonlinear Science and Numerical Simulation*

Received date: 15 April 2017
Revised date: 9 August 2017
Accepted date: 23 November 2017

Please cite this article as: Weiguo Zhang, Xiang Li, Shaowei Li, Xu Chen, Orbital stability of solitary waves for generalized Boussinesq equation with two nonlinear terms, *Communications in Nonlinear Science and Numerical Simulation* (2017), doi: [10.1016/j.cnsns.2017.11.018](https://doi.org/10.1016/j.cnsns.2017.11.018)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Orbital stability of solitary waves for generalized Boussinesq equation with two nonlinear terms

Weiguo Zhang^{*,1}, Xiang Li¹, Shaowei Li², Xu Chen¹

1. College of Science, University of Shanghai for Science and Technology, Shanghai, 200093, P.R. China

2. School of Mathematics & information Engineering, Taizhou University, Taizhou, 317000, P.R.China

Abstract

This paper investigates the orbital stability and instability of solitary waves for the generalized Boussinesq equation with two nonlinear terms. Firstly, according to the theory of Grillakis-Shatah-Strauss orbital stability, we present the general results to judge orbital stability of the solitary waves. Further, we deduce the explicit expression of discrimination $d''(c)$ to judge the stability of the two solitary waves, and give the stable wave speed interval. Moreover, we analyze the influence of the interaction between two nonlinear terms on the stable wave speed interval, and give the maximal stable range for the wave speed. Finally, some conclusions are given in this paper.

Keywords:

generalized Boussinesq equation, nonlinear terms, solitary wave, orbital stability

2000 MSC: 35Q35, 35Q51, 37K45

1. Introduction

Boussinesq equation

$$u_{tt} + u_{xxxx} - u_{xx} - b_1(u^2)_{xx} = 0, \quad (1.1)$$

an important model in the field of physics and mechanics [1, 2, 3, 4], describes the wave propagation in the weakly nonlinear and dispersive medium. Be-

Corresponding author. Email.zwgzwm@126.com; Tel. +86-021-65667049.

Download English Version:

<https://daneshyari.com/en/article/7154873>

Download Persian Version:

<https://daneshyari.com/article/7154873>

[Daneshyari.com](https://daneshyari.com)