

## Spectral stability of periodic waves in the generalized reduced Ostrovsky equation

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Received: 16 June 2016 / Revised: 25 October 2016 / Accepted: 15 January 2017 / Published online: 2 February 2017 © The Author(s) 2017. This article is published with open access at Springerlink.com

**Abstract** We consider stability of periodic travelling waves in the generalized reduced Ostrovsky equation with respect to co-periodic perturbations. Compared to the recent literature, we give a simple argument that proves spectral stability of all smooth periodic travelling waves independent of the nonlinearity power. The argument is based on the energy convexity and does not use coordinate transformations of the reduced Ostrovsky equations to the semi-linear equations of the Klein–Gordon type.

Keywords Reduced Ostrovsky equations  $\cdot$  Stability of periodic waves  $\cdot$  Energy-toperiod map  $\cdot$  Negative index theory

## Mathematics Subject Classification 35B35 · 35G30

## **1** Introduction

We address the generalized reduced Ostrovsky equation written in the form

$$(u_t + u^p u_x)_x = u, (1)$$

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