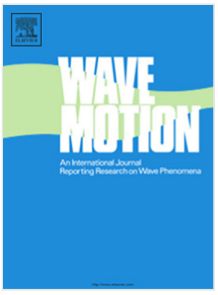
Accepted Manuscript



Second-order perturbation analysis of low-amplitude traveling waves in a periodic chain with quadratic and cubic nonlinearity

Smruti R. Panigrahi, Brian F. Feeny, Alejandro R. Diaz

PII: S0165-2125(16)30139-1
DOI: http://dx.doi.org/10.1016/j.wavemoti.2016.11.004
Reference: WAMOT 2122

To appear in: *Wave Motion*

Received date: 1 May 2016
Revised date: 2 November 2016
Accepted date: 3 November 2016

Please cite this article as: S.R. Panigrahi, B.F. Feeny, A.R. Diaz, Second-order perturbation analysis of low-amplitude traveling waves in a periodic chain with quadratic and cubic nonlinearity, *Wave Motion* (2016), http://dx.doi.org/10.1016/j.wavemoti.2016.11.004

*Research Highlights

Research highlights

- ➔ A second-order perturbation analysis of single-wave propagation in a periodic nonlinear chain is presented using both discrete and continuum analysis.
- ➔ While the first-order multiple scales captures the cubic effect alone, the second-order analysis uncovers the quadratic effect.
- ➔ The quadratic nonlinearity shows to affect the wave propagation velocities and phases.