Solitary Wave Families in Two Non-Integrable Models Using Reversible Systems Theory

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Overview

- Definitions
- Background
- Literature Review
- Method of Solution
- The Generalized Pochammer-Chree Equations
- A Generalized Microstructure Equation

Reversible Dynamical System (Iooss & Adelmeyer)

Consider

$$\frac{dz}{dt} = F(z;\mu), z \in \mathbb{R}^n, \mu \in \mathbb{R} \tag{1}$$

where

$$F(0;0) = 0$$

. If there exits a **unitary map**

$$S : \mathbb{R}^n \mapsto \mathbb{R}^n, S \neq I$$

such that

$$F(Sz;\mu) = -SF(z;\mu)\,\forall z,\mu$$

then (1) is a reversible system.

Families of Solitary Waves

Here we will use the term solitary wave or "solitons" in the broadest sense, as a solution to a nonlinear equation which ETC

Normal Form Theory

Properties of Bilinear Functions

Selected Literature Review

The Generalized Pochammer-Chree Equations

A Generalized Microstructure PDE

Results: The Generalized Pochammer-Chree Equations

Results: A Generalized Microstructure PDE