FINITE DIFFERENCE SCHEME FOR THE HIGH ORDER NONLINEAR SCHRÖDINGER EQUATION WITH LOCALIZED DISSIPATION.

MARCELO M. CAVALCANTI, WELLINGTON J. CORRÊA, MAURICIO SEPÚLVEDA CORTÉS, AND RODRIGO VÉJAR ASEM

Abstract. A Finite Difference scheme for the High Order Nonlinear Schrödinger (HNLS) equation in 1D, with localized damping, will be presented. The equation can model superluminal optical solitons in atomic systems, as well as femtosecond solitons travelling in optical fibers made by different materials. The method can preserve the numerical energy, and can almost preserve the numerical charge. Numerical results will be shown.

Keywords: finite differences, HNLS, energy decay.

Mathematics Subject Classifications (2010): 65M06, 65Z05.

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Departamento de Matemática, Universidade Estadual de Maringá, Maringá, Brasil
E-mail address: mmcavalcanti@uem.br

Departamento Acadêmico de Matemática, Universidade Tecnológica Federal do Paraná, Campo Mourão, Brasil.
E-mail address: wcorrea@utfpr.edu.br

CI^{2}MA - DIM, Universidad de Concepción, Concepción, Chile.
E-mail address: mauricio@ing-mat.udec.cl

CI^{2}MA - DIM, Universidad de Concepción, Concepción, Chile.
E-mail address: rodrigovejar@ing-mat.udec.cl