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ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΟΥ ΔΙΠΛΩΜΑΤΟΣ ΕΙΔΙΚΕΥΣΗΣ

Τίτλος

« Study of the Discrete Non-linear Schrödinger Equation in Small World and Scale Free Networks »

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Abstract

In this thesis the numerical investigations for the dynamical aspects, self-trapping and propagation, of the Discrete Non-linear Schrödinger (DNLS) equation in small-world and scale-free networks are discussed. At the DNLS equations localized initial conditions were used and the following cases were studied: a) the fully linear, b) the linear with on site disorder, c) the non-linear and d) the non-linear with on site disorder. For the scale free network and for the cases mentioned the amount of localization is found as a function of the coordination number of the node where the excitation was initially placed. For the small world lattices the localization and propagation properties have been studied as a function of the number of bonds in the lattice, from the nearest neighbor (N.N.) all the way to the fully connected network (M.F.), for the cases a), b) and d).