

Large Time Soliton Asymptotics for the Solutions of a Coupled Non-Linear Wave-Particle System

Boris Vainberg
brvainbe@uncc.edu
Department of Mathematics
UNC-Charlotte
376 Fretwell Bldg.
9201 University City Blvd.
Charlotte, NC 28223
USA

Abstract

We establish a large time asymptotics for the nonlinear system of Klein-Gordon equation coupled to a charged particle. The coupled system has a six dimensional manifold of the soliton solutions. We show that in the large time approximation, any solution, with the initial state close to the solitary manifold, is a sum of a soliton and a dispersive wave which is a solution of the free Klein-Gordon equation. It is assumed that the charge density satisfies the Wiener condition which is a version of the Fermi Golden Rule. The proof is based on a development of the strategy of Buslaev-Perelman.

The results are joint with V. Imaikin and A. Komech.