

Fixed point theorem based solvability of 2-dimensional dissipative cubic nonlinear Klein-Gordon equation

ABSTRACT

The purpose of this article is to establish the solvability of the 2-Dimensional dissipative cubic nonlinear Klein-Gordon equation (2DDCNLKGE) through periodic boundary value conditions (PBVCs). The analysis of this study is founded on the Galerkin's method (GLK) and the Leray-Schauder's fixed point theorem (LS). First, the GLK method is used to construct some uniform priori estimates of approximate solution to the corresponding equation of 2DDCNLKGE. Finally, the LS fixed point theorem is applied to obtain the efficient and straightforward existence and uniqueness criteria of time periodic solution to the 2DDCNLKGE.

Keyword: 2-Dimensional dissipative cubic nonlinear Klein-Gordon equation; Periodic solution; GLK method; LS fixed point theorem