Abstract

In the first part of this thesis, suitable function spaces for analysis of partial differential equations in unbounded domains are introduced and studied. The results are then applied in the second part on semilinear wave equation in $\mathbb{R}^d$ with nonlinear source term and nonlinear damping. The source term is supposed to be bounded by a polynomial function with a subcritical growth. The damping term is strictly monotone and satisfying a polynomial-like growth condition. Global existence is proved using finite speed of propagation. Dissipativity in locally uniform spaces and the existence of a locally compact attractor are then obtained after additional conditions imposed on the damping term.