Librería

Bonilla y Asociados

desde 1950

Título:

Autor:

Editorial:

Tema:

Precio: $723.00

Año: 2011

Edición: 1ª

ISBN: 9783037190951

Sinopsis

The notion of an invariant manifold arises naturally in the asymptotic stability analysis of stationary or standing wave solutions of unstable dispersive Hamiltonian evolution equations such as the focusing semilinear Klein-Gordon and Schrödinger equations. This is due to the fact that the linearized operators about such special solutions typically exhibit negative eigenvalues (a single one for the ground state), which lead to exponential instability of the linearized flow and allows for ideas from hyperbolic dynamics to enter.

One of the main results proved here for energy subcritical equations is that the center-stable manifold associated with the ground state appears as a hyper-surface which separates a region of finite-time blowup in forward time from one which exhibits global existence and scattering to zero in forward time. The authors' entire analysis takes place in the energy topology, and the conserved energy can exceed the ground state energy only by a small amount.

This monograph is based on recent research by the authors. The proofs rely on an interplay between the variational structure of the ground states and the nonlinear hyperbolic dynamics near these states. A key element in the proof is a virial-type argument excluding almost homoclinic orbits originating near the ground states, and returning to them, possibly after a long excursion.

These lectures are suitable for graduate students and researchers in partial differential equations and mathematical physics. For the cubic Klein-Gordon equation in three dimensions all details are provided, including the derivation of Strichartz estimates for the free equation and the concentration-compactness argument leading to scattering due to Kenig and Merle.