
STANDING WAVES FOR SCHRÖDINGER EQUATION WITH KATO POTENTIALS

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We consider the nonlinear Schrödinger equation with potentials belonging to the Kato class and with L^∞ -bounded nonlinearities. The associated parabolic problem is studied by use of Conley index techniques. To this end, we establish the admissibility of the parabolic semiflow and investigate the structure of its maximal invariant set in both resonant and non-resonant cases. We obtain, in a sequence of steps, estimates for the maximal invariant set in both the uniform norm and the energy space norm. Finally, we present results demonstrating that, under Landesman-Lazer conditions, the Schrödinger equation admits standing wave solutions with frequencies lying below the essential spectrum of the Schrödinger operator. These results are obtained in collaboration with Piotr Kokocki and Wojciech Kryszewski.

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