

M A T H E M A T I C A L P H Y S I C S S E M I N A R

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Aharonov–Bohm Effect in Resonances of Magnetic Schrödinger Operators with Potentials with Supports at Large Separation

Abstract

Vector potentials are known to have a direct significance to quantum particles moving in the magnetic field. This is called the Aharonov-Bohm effect and is known as one of the most remarkable quantum phenomena. Here we study this quantum effect through the resonance problem. We consider the scattering system consisting of two scalar potentials and one magnetic field with supports at large separation in two dimensions. The system has trajectories oscillating between these supports. We give a sharp lower bound on the resonance widths as the distances between the three supports go to infinity. The bound is described in terms of the backward amplitude for scattering by each of the scalar potentials and by the magnetic field, and it also depends heavily on the magnetic flux of the field.