Abstract

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“Eigenvalue distribution for the 2-dim Schrödinger operator
with strong magnetic field”

We consider the spectrum of the two-dimensional Schrödinger operator with homogeneous magnetic field: $P(\mu) = P_0(\mu) + V(x, y)$ in $L^2({}^2)$, where $P_0(\mu) = (D_x - \mu y)^2 + D_y^2$. Here μ is a positive parameter proportional to the strength of the magnetic field. The non-perturbed operator $P_0(\mu)$ has eigenvalues with infinite multiplicity at the so called Landau levels. The perturbation $V \in C^\infty({}^2;)$, which decays at infinity, may create eigenvalues with finite multiplicity around each Landau level. We are intersted in the asymptotic distribution of such eigenvalues in the strong magnetic limit $\mu \to \infty$.

In this talk, we give the precise asymptotics of the eigenvalues near the minimum of the potential. To obtain this result, we first use the Feshbach reduction to reduce the operator $P(\mu)$ to a one-dimensional pseudo-differential operator with principal symbol $V(x, \xi)$, and then use the WKB method to construct asymptotic series of eigenfunctions and eigenvalues.