

On the semi-classical analysis of Schrödinger operators with linear electric potentials in a bounded domain

Rayan Fahs

Larema, Université d'Angers, France

The aim of this talk is to improve the asymptotic expansion of the eigenvalues of the Laplace operator, with strong uniform electric field and Dirichlet boundary conditions on a smooth bounded domain of \mathbb{R}_N . This work aims at generalizing the recent results of Cornean, Krejcirik, Pedersen, Raymond and Stockmeyer in dimension 2. More precisely, in dimension N , in the strong electric field limit, we derive, under certain local convexity conditions, a full asymptotic expansion of the low-lying eigenvalues, by involving the eigenvalues of the Weingarten map of $\partial\Omega$. To establish our main result, we perform the construction of quasi-modes that will make it possible to obtain the upper bounds for the eigenvalues. The "optimality" of our constructions is then established thanks to a reduction to model operators and localization estimates