Two-sided Lieb-Thirring bounds

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Abstract

We discuss upper and lower bounds for the number of eigenvalues of semi-bounded Schrödinger operators in all spatial dimensions. For atomic Hamiltonians with Kato potentials one can strengthen the result to obtain two-sided estimates for the sum of the negative eigenvalues. Instead of being in terms of the potential itself, as in the usual Lieb-Thirring result, the bounds are in terms of the landscape function, also known as the torsion function, which is a solution of $(-\Delta + V + M)u_M = 1$ in $\mathbb{R}^d$; here $M \in \mathbb{R}$ is chosen so that the operator is positive.

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