İSTANBUL ANALYSIS SEMINARS

EQUICONVERGENCE OF SPECTRAL DECOMPOSITIONS OF HILL-SCHRÖDINGER OPERATORS

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Abstract: We study in various functional spaces the equiconvergence of spectral decompositions of the Hill operator $L = -d^2/dx^2 + v(x)$, $x \in [0, \pi]$, with H^{-1}_{per}-potential and the free operator $L^0 = -d^2/dx^2$, subject to periodic, antiperiodic or Dirichlet boundary conditions.

In particular, we prove that

$$\|S_N - S_N^0 : L^a \to L^b\| \to 0 \quad \text{if} \quad 1 < a \leqslant b < \infty, \quad 1/a - 1/b < 1/2,$$

where S_N and S_N^0 are the N-th partial sums of the spectral decompositions of L and L^0. Moreover, if $v \in H^{-\alpha}$ with $1/2 \leqslant \alpha < 1$ and $\frac{1}{a} = \frac{3}{2} - \alpha$, then we obtain uniform equiconvergence: $\|S_N - S_N^0 : L^a \to L^\infty\| \to 0$ as $N \to \infty$.

This talk is based on joint results with Boris Mityagin.

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