Resonances for Schrödinger operator with periodic plus compactly supported potentials

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Abstract

We consider the Schrödinger operator $H_y = -y'' + p(y) + q(y)$ in $L^2(\mathbb{R}^+)$ and $L^2(\mathbb{R})$, where the potential p is real 1-periodic and the potential q is real compactly supported. We prove the following results :

1. a forbidden domain for the resonances is specified

2. the distribution of resonances in the disk with radius $r \to \infty$ is determined

3. the asymptotics of resonances and eigenvalues in the gap are determined at high energy