Asymptotics of the discrete spectrum of a model operator associated with a system of three particles on a lattice

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In this talk we consider a bounded self-adjoint model operator H of the form

$$H = H_0 - V_1 - V_2,$$

associated with a system of three identical particles on a three-dimensional lattice. Here H_0 is the multiplication operator with the parameter function w and V_i, $i = 1, 2$, are partial integral operators. We discuss the case where the parameter function w has a special form with non-degenerate minimum at n points of the six-dimensional torus ($n > 1$).

If we denote by m the bottom of the essential spectrum $\sigma_{ess}(H)$ of H and by $N(z)$ the number of eigenvalues of H lying below z, $z < m$, then the main result of this talk is the following relation between the number n and the function $N(\cdot)$:

$$\lim_{z \to m-0} |log|z - m||^{-1} N(z) = n\mathcal{U}_0, \ (0 < \mathcal{U}_0 < \infty),$$

in the case where corresponding Friedrichs model has a threshold energy resonance.

The talk is based on results of the paper [1].

[1]. *T.Kh. Rasulov.* Asymptotics of the Discrete Spectrum of a Model Operator Associated with the System of Three-Particles on a Lattice. Theor. Math. Phys. **163** (2010), No. 1, 429–437.