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Spectral theory of Laplacians for Hecke groups with primitive character

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Introduction

It was proved by [Se1] that the Laplacian $A(\Gamma)$ for congruence subgroups Γ of the modular group $\Gamma_{\mathbf{Z}}$ has an infinite sequence of embedded eigenvalues $\{\lambda_i\}$ satisfying a Weyl law $\#\{\lambda_i \leqslant \lambda\} \sim (|F|/4\pi)\lambda$ for $\lambda \to \infty$. Here $|F|$ is the area of the fundamental domain F of the group Γ, and the eigenvalues λ_i are counted according to multiplicity. The same holds true for the Laplacian $A(\Gamma;\chi)$, where χ is a character on Γ and $A(\Gamma;\chi)$ is associated with a congruence subgroup Γ_1 of Γ. It is an important question whether this is a characteristic of congruence groups or it may hold also for some non-congruence subgroups of $\Gamma_{\mathbf{Z}}$. To investigate this problem Phillips and Sarnak studied perturbation theory for Laplacians $A(\Gamma)$ with regular perturbations derived from modular forms of

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