

Explicit computation of denominators of Eisenstein cohomology classes

Abstract: I think that it is a major task to write a computer program which computes the cohomology $H^\bullet(\Gamma \backslash X, \mathcal{M}_{\mathbb{Z}})$ the restriction map to the boundary cohomology

$$r : H^\bullet(\Gamma \backslash X, \mathcal{M}_{\mathbb{Z}}) \rightarrow H^\bullet(\partial(\Gamma \backslash X), \mathcal{M}_{\mathbb{Z}})$$

and an explicit formula for a Hecke operator T_p acting on these modules. Here explicit means to write these cohomology groups as direct sums of cyclic groups with generators e_i and giving explicit matrices for r, T_p .

Such a program would give us the denominators of Eisenstein classes and we could verify the conjectural congruences between elliptic and Siegel modular forms experimentally.

Such a program has been written by H. Gangl and myself for $\Gamma = \mathrm{Sl}_2(\mathbb{Z})$.

I will discuss a very "theoretical" version of such a program.