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Regularized Determinants of CY Metrics, Borcherds Products; Applications to K3 Surfaces

In this talk we will prove that there exists a holomorphic section of the relative dualizing sheaf over some finite cover of the moduli space of polarized CY manifolds whose L^2 norm is equal to the regularized determinant of the CY metric of the Laplacian acting on $(0, 1)$ forms. We will show that in case of M -polarized K3 surfaces this section can be represented as Borcherds' product. Its logarithmic derivative counts nonsingular rational curves on K3 surface when M is an unimodular lattice.