Orthogonality of invariant vectors

Abstract

Let (π, V) be an irreducible complex representation of a finite group G and let $\langle\ ,\ \rangle_\pi$ be the standard G-invariant inner product on π. Let H and K be subgroups of G such that the space of H-invariant vectors as well as the space of K-invariant vectors of π are one dimensional. Fix an H-invariant unit vector v_H and a K-invariant unit vector v_K. Benedict Gross defines the Correlation constant $c(\pi; H, K)$ of H and K with respect to π. It turn out that $c(\pi; H, K) = |\langle v_H, v_K\rangle_\pi|^2$.

In this talk we analyze the Correlation constant $c(\pi; H, K)$, when $G = \mathrm{GL}_2(\mathbb{F}_q)$, where $\mathbb{F}_q$ is the finite field with $q = p^f$ elements for some odd prime p, H (resp. K) is the split (resp. non split) torus of G. This is joint with U. K. Anandavardhanan.