Harmonic Polynomials and Zeta Polynomials of Finite Unitary Reflection Groups

ABSTRACT

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We consider several polynomials constructed from finite unitary reflection groups G. First we consider the properties of harmonic space $\mathrm{Harm}(k, l)^G$, i.e. the space of harmonic polynomials which is invariant under the action of the groups G. In this case, we calculate the polynomials Φ^G which is the dimension formula of $\mathrm{Harm}(k, l)^G$. Next we calculate the Eisenstein polynomials φ_ℓ^G and Zeta polynomials $P(T)_{\varphi_\ell^G}$ from G with degree one ($G_4 - G_{22}$). The result of Zeta polynomials later can be used to prove the analogues properties between Eisenstein series and Eisenstein polynomials.

Key Words: *Finite Unitary Reflection Groups, Harmonics Polynomials, Eisenstein Polynomials, Zeta Polynomials.*