
MICHAEL STESSIN, SUNY at Albany

Spectral characterization of representations of symmetry groups

Joint work with Z.Cuckovic.

Joint projective spectra of operator tuples generalize projective determinantal hypersurfaces that have been studied since 1920s. It was shown in a recent paper of Stessin and Tchernev that the appearance of certain quadrics in two-dimensional sections of joint spectrum of a tuple of self-adjoint operators implies the existence of subspace invariant for the tuples such that the group generated by restrictions of the operators to this subspace represents a Coxeter group.

We further investigate the connection between determinantal hypersurfaces and representations of Symmetry groups. Our main result is stated as follows.

Theorem. Let G be one of the groups A_n , B_n or a dihedral group $Ip(n)$ and let ρ_1 and ρ_2 be two representations of G . If the joint projective spectra of images of Coxeter generators of G under ρ_1 and ρ_2 are the same,

$$\sigma(\rho_1(w_1), \dots, \rho_1(w_n), I) = \sigma(\rho_2(w_1), \dots, \rho_2(w_n), I),$$

then ρ_1 and ρ_2 are equivalent.