

Plan for study

FUJII, Shinobu

For isoparametric hypersurfaces in spheres with four distinct principal curvatures, we want to study the followings:

- (1) relation to moment maps.
- (2) relation to invariant rings.

First, we explain the first problem. We have constructed a Cartan-Münzner polynomial from a moment map for the isotropy representation of an irreducible Hermitian symmetric spaces of rank two. We want to study whether a Cartan-Münzner polynomial can be constructed from a moment map for other cases. We concretely consider the followings:

- (i) isoparametric hypersurfaces of FKM-type.
- (ii) the isotropy representation of $SO(5) \times SO(5)/SO(5)$.

Next, we explain the second problem. Cartan-Münzner polynomials which are constructed in [1] are homogeneous polynomial of degree four which are invariant under the isotropy representation. We want to characterize a Cartan-Münzner polynomial from a view of invariant theory. We expect that a moment map may be constructed from a Cartan-Münzner polynomial via invariant theory. We concretely consider the followings:

- (i) the isotropy representation of $SO(2+n)/SO(2) \times SO(n)$.
- (ii) the isotropy representation of Hermitian symmetric spaces of rank two except for $SO(2+n)/SO(2) \times SO(n)$.
- (iii) the isotropy representation of $E_6/U(1) \times Spin(10)$.
- (iv) isoparametric hypersurfaces of FKM-type.