

Title: Inverting the branching rules in a multiplicity free setting

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Abstract:

Branching rules for compact groups describe how an irreducible representation decomposes upon restricting to a compact subgroup.

In general, the branching rule can be described by an alternating sum over a Weyl group of counting functions depending on roots and weights.

In certain multiplicity free examples, one can rewrite these complicated formulas into "interlacings conditions" for the weights of the irreducible representations.

Assuming a multiplicity freeness condition, we will discuss the inversion of the branching rules: fix an irreducible representation of the subgroup and determine in which irreducible representations of the overgroup it occurs upon restriction.

The multiplicity free setting at hand allows us to invoke the theory of spherical varieties to solve this problem. We recover the Cartan-Helgason theorem for symmetric spaces, some of the classical branching rules and new inverted branching rules that are relevant for harmonic analysis of vector bundles over compact Riemann symmetric pairs.

This is joint work with Guido Pezzini (La Sapienza, Rome).