

The spherical principal series and related problems in classical invariant theory

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Abstract: We present a celebrated theorem of Bertram Kostant and Stephen Rallis. This result has important implications in classical invariant theory, while at the same time is closely related to the spherical principal series of a reductive Lie group. We will describe a program to generalize the result, and report some success in this direction for the classical groups obtained jointly with Roger Howe and Eng Chye Tan. The results are combinatorial in nature as they involve the ubiquitous Littlewood-Richardson coefficients.