

**N. Ressayre**

Institute de Mathématiques et de Modélisation, Université Montpellier 2, 34095 Montpellier,  
France  
`ressayre@math.univ-montp2.fr`

## Reductions for Branching Coefficients

Let  $G$  be a connected reductive subgroup of a complex connected reductive group  $\widehat{G}$ . The branching problem consists in decomposing irreducible  $\widehat{G}$ -representations as sums of irreducible  $G$ -representations. The appearing multiplicities are parameterized by the pairs  $(\nu, \hat{\nu})$  of dominant weights for  $G$  and  $\widehat{G}$  respectively. The support  $\text{LR}(G, \widehat{G})$  of these decompositions is a finitely generated semigroup of such pairs of weights. The cone  $\mathcal{LR}(G, \widehat{G})$  generated by  $\text{LR}(G, \widehat{G})$  is convex polyhedral and the explicit list of inequalities characterizing it is known. There are the inequalities stating that  $\nu$  and  $\hat{\nu}$  are dominant and those giving faces containing regular weights (called regular faces), that are parameterized by cohomological conditions.

In this paper, we describe the multiplicities corresponding to the pairs  $(\nu, \hat{\nu})$  belonging to any regular face of  $\mathcal{LR}(G, \widehat{G})$ . More precisely, we prove that such a multiplicity is equal to a similar multiplicity for strict Levi subgroups of  $G$  and  $\widehat{G}$ . This generalizes, unifies and simplifies, by different methods, results obtained by Brion, Derksen-Weyman, Roth, and others.

**Keywords:** Branching rules, eigencone.

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