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Littlewood-Richardson coefficients for reflection groups.

Let G be a simple Lie group or Kac-Moody group and P be a parabolic subgroup of G . One of the goals Schubert calculus is to understand the product structure of the cohomology ring $H^*(G/P)$ with respect to its basis of Schubert classes. If G/P is the Grassmannian, then the structure constants corresponding to the Schubert basis are the classical Littlewood-Richardson coefficients which appear in various topics such as enumerative geometry, algebraic combinatorics and representation theory.

In this talk, I will discuss joint work with A. Berenstein in which we give a combinatorial formula for these coefficients in terms of the Cartan matrix corresponding to G . In particular, our formula implies positivity of the “generalized” Littlewood-Richardson coefficients in the case where the off diagonal Cartan matrix entries are not equal to -1 . Moreover, this positivity result is purely algebraic and does not rely on the geometry of the flag variety G/P . (Received September 22, 2011)