An insertion algorithm on Schubert polynomials

Sami Assaf
University of Southern California

Abstract

Schubert polynomials originated in the study of the cohomology ring for the complete flag manifold by Bernstein, Gelfand, and Gelfand and Demazure, with their combinatorics developed extensively by Lascoux and Schutzenberger. For each permutation, there is a Schubert polynomial which, when evaluated at certain Chern classes, gives the cohomology class of a Schubert subvariety of the flag manifold. Thus the Schubert structure constants enumerate flags in a suitable triple intersection of Schubert varieties. As such, they are known from geometry to be nonnegative. A fundamental open problem in algebraic combinatorics is to give a positive combinatorial formula for these structure constants.

Recently, I conjectured a formula for Schubert structure constants in the classical flag manifold that occur in the product of an arbitrary Schubert class by one pulled back from a Grassmannian projection. In this talk, I'll present joint work with Nantel Bergeron in which we define an insertion algorithm on Kohnert diagrams, proving this conjecture.

This talk should be generally accessible, with no prior knowledge of Schubert varieties or Schubert polynomials is required.