Stanford Algebraic Geometry — Seminar —

DEGENERACY LOCI, QUIVER COEFFICIENTS AND SCHUBERT CALCULUS

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Abstract

In this talk, we describe some interactions between the algebraic geometry and the combinatorics of the following setting studied by A. Buch and W. Fulton: Let X be a nonsingular complex algebraic variety and $E_0 \to E_1 \to \cdots \to E_n$ be a sequence of vector bundles and morphisms over X. This gives rise to a degeneracy locus, a subscheme of X.
What are formulas for the class of the structure sheaf of this locus in the K-theory? This question was originally answered in terms of "Quiver coefficients", which were conjectured to alternate in sign according to codimension.
Combinatorial formulas for the Quiver coefficients, especially those that explain the alternating signs, are of interest since they provide, e.g.,:
(1) new "Giambelli-type" formulas for Schubert classes, for both classical and quantum cohomology of partial flag varieties;
(2) generalizations of the classical and K-theory Littlewood-Richardson rules for Grassmannians;
(3) generalizations of the classical Giambelli-Thom-Porteous determinantal formulas.
We present explanations for the alternating sign phenomenon and give new combinatorial formulas for the Quiver coefficients. In particular, we suggest a geometric rationale for the alternating signs: the Quiver coefficients are Schubert structure constants for flag varieties. Generalizations of Quiver coefficients to the other classical Lie types will also be discussed.
This talk is based on math.AG/0211300, math.CO/0306389, math.CO/0307019 and joint work with A. Buch and F. Sottile. Few prerequisites will be assumed.

Friday, October 10
3:00 p.m.
Room 383-N

http://math.stanford.edu/~vakil/seminar0304/