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Thomas Lam* (tfylam@math.harvard.edu), Harvard University, Department of Mathematics, Science Center, One Oxford Street, Cambridge, MA 02138. *Schubert polynomials for affine Grassmannians.*

We give polynomials representatives of homology and cohomology Schubert classes for the affine Grassmannian (of type A). These polynomials are symmetric functions known as k -Schur functions (homology) and dual k -Schur functions or affine Schur functions (cohomology). These are conjectures of Shimozono, later made more precise in the cohomology case by Morse.

Our strategy involves a study of a commutative subalgebra of the nilCoxeter algebra, which we call the Fomin-Stanley subalgebra. This subalgebra is important in the definition and study of Stanley symmetric functions. For the cohomology result, we study the relationship between this algebra and the nilHecke ring of Kostant and Kumar. For the homology result, in addition we require a result of Peterson, which embeds the homology of the affine Grassmannian into the nilHecke ring. As consequences we obtain some of the positivity conjectures for k -schur and affine Schur functions.

Some of our results hold for affine Grassmannians of arbitrary type and is one step towards understanding why Stanley symmetric functions are related to geometry. (Received September 09, 2005)