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MV cycles from generalized orbital varieties

Representations constructed from the geometry of homogeneous spaces involve many choices, so we would like to parametrize coarse invariants, like dimensions of weight spaces of irreducible representations, by combinatorial objects. A classical example is the Grothendieck–Springer resolution of the variety of nilpotent elements $\mathcal{N}$ in a semi-simple Lie algebra: the top Borel-Moore homology of a fibre of this resolution is an irreducible representation of the associated Weyl group. In type A, a canonical basis is parametrized by Young tableaux. This talk will review a more modern example: the torus-equivariant cohomology of upper-triangular Slodowy slices. We explain the representation theory and combinatorics of this example: using the geometric Satake correspondence and a Spaltenstein decomposition, we show that orbital varieties in Slodowy slices define bases in representations. Under the magnifying glass of a finer geometric invariant — the Duistermaat-Heckmann measure — we show that not all bases are created equal.