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The Steinberg basis and the twisted gamma-filtration

For a simple linear algebraic group G and a projective G-homogeneous variety X, a result of Panin relates the indices of the Tits algebras of G to non-trivial torsion elements in the γ-filtration on the Grothendieck group $K_0(X)$. Such torsion elements are of interest due to their close connection to the Chow group of X and to the set of cohomological invariants of G. The Steinberg basis of $K_0(X)$ provides an explicit set of generators for the γ-filtration, however the relations are not easily computed.

A tool introduced by Zainoulline called the twisted γ-filtration acts as a surjective image of the γ-filtration, with explicit sets of both generators and relations. In this talk we use the twisted γ-filtration to construct torsion elements in the degree 2 component of the γ-filtration for groups of inner type D_{2n}.