

1070-05-204

**Aba Mbirika\*** ([ambirika@bowdoin.edu](mailto:ambirika@bowdoin.edu)). *Combinatorial commutative algebra meets an object from geometric representation theory.*

The well-studied Springer variety is at the heart of algebraic geometry and representation theory. Hessenberg varieties are an important generalization of the Springer varieties to a two-parameter family of varieties. Although Hessenberg varieties arise in many contexts, little is known about their cohomology rings. We employ techniques of both combinatorics and commutative algebra to study these rings using polynomial quotient rings. Analogous to the Springer setting and the so-called Tanisaki ideals, we build ideals of what we call truncated symmetric functions generalizing the Tanisaki ideals. The quotient we build successfully describes the Betti numbers of the cohomology ring of regular nilpotent Hessenberg varieties. In their own right, however, these ideals of truncated symmetric functions are very interesting. We give an alternate description of these ideals via a Gröbner basis presentation. Along the way we prove a remarkable connection between elementary and complete truncated symmetric functions. (Received February 11, 2011)