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Minimal nilpotent Hessenberg varieties

Hessenberg varieties constitute a diverse and interesting family of subvarieties of the flag variety. They are studied in a number of areas, including algebraic geometry, combinatorics, geometric representation theory, and equivariant topology. With respect to the last of these disciplines, there has been a great deal interest in understanding the equivariant cohomology rings associated with appropriately defined torus actions on Hessenberg varieties.

Now, let G be a simply-connected simple group over $\mathbb{C}$, and fix a maximal torus and Borel subgroup, $T \subseteq B$, respectively. I will explain what it means for $X \subseteq G/B$ to be a minimal nilpotent Hessenberg variety. I will subsequently offer two descriptions of $H_T^*(X)$. The first arises from GKM theory, while the second description results from exhibiting $H_T^*(X)$ as a quotient of $H_T^*(G/B)$.

This represents joint work with Hiraku Abe