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Symmetric quivers and symmetric varieties

Since the 1980s, mathematicians have found connections between orbit closures in type A quiver representation varieties and Schubert varieties in type A flag varieties. For example, singularity types appearing in type A quiver orbit closures coincide with those appearing in Schubert varieties in type A flag varieties; combinatorics of type A quiver orbit closure containment is governed by Bruhat order on the symmetric group; and classes of type A quiver orbit closures in equivariant cohomology and K-theory (as well as classes of associated degeneracy loci) can be expressed in terms of formulas involving Schubert polynomials, Grothendieck polynomials, and other objects from Schubert calculus.

After recalling some of this story, I will motivate and discuss the related setting of Derksen-Weyman's symmetric quivers and their representation varieties. I will show how one can adapt results from the ordinary type A setting to unify aspects of the equivariant geometry of type A symmetric quiver representation varieties with Borel orbit closures in a corresponding symmetric variety G/K (G = general linear group, K = orthogonal or symplectic group). This is joint work with Ryan Kinser and Martina Lanini.