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Type D quiver loci and double Grassmannians

A quiver Q is a finite directed graph and a representation of Q is an assignment of vector space to each vertex and linear map to each arrow. Once the vector spaces have been fixed, the space of representations is an affine space. This affine space carries the action of a product of general linear groups. By Gabriel's Theorem, there are finitely many orbit closures (a.k.a. quiver loci) precisely when the underlying un-directed graph of Q is a type A, D, or E Dynkin diagram.

Type A quiver loci are well understood. They are isomorphic, up to smooth factor, to open subvarieties of Schubert varieties. After discussing some motivation and background, I'll consider the next simplest setting, that is, when the underlying graph is a type D Dynkin diagram. Building on work of Bobinski-Zwara on singularities of type D quiver loci, I'll show that type D quiver loci are isomorphic, up to smooth factor, to open subvarieties of certain orbit closures in double Grassmannians, and provide some geometric and combinatorial consequences of this isomorphism.

This is joint work in progress with Ryan Kinser.