Frobenius splitting of orbit closures associated to type A quivers

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Given a quiver and fixed dimension vector, we may consider the variety of representations and its poset of orbit closures. In the case where the quiver is equioriented of type A, Zelevinsky, Lakshmibai, and Magyar proved that there is an isomorphism between an orbit closure and an open subvariety of a Schubert variety. From this, it follows that equioriented type A orbit closures are Frobenius split.

I'll discuss the case where the quiver is type A and bipartite (i.e. every vertex is a source or sink). In particular, I'll describe an isomorphism between an orbit closure and a certain F-split subvariety of the Grassmannian, and I'll explicitly describe the F-splitting of the orbit closure. Using the isomorphism, along with work of Knutson, Lam, and Speyer, we'll be able to recover that orbit closures of type A bipartite quivers are normal, Cohen-Macaulay, and have rational singularities. I'll end with a few remarks about the general type A setting.

This work is joint with Ryan Kinser.