Resolutions of defining ideals of orbit closures

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For Dynkin quiver Q of finite representation type, we look at representation space of Q of fixed dimension vector (call it $Rep(Q, d)$), this is a vector space with an affine structure. There is a natural action of the group $Gl(d)$ on $Rep(Q, d)$ and the corresponding orbit closures form an affine variety.

For the class of orbit closures having a 1-step desingularization (as prescribed by Reineke) for non-equioriented quiver of type A_3, we find a resolution of the defining ideal of the orbit closures and give the minimal generators of this ideal. This situation generalizes to some more Dynkin quivers of type A_n and also gives results about the normality and Cohen-Macaulayness of the corresponding orbit closures.

I will present the main tools used in above calculations and the results obtained so far. This is part of my thesis work under the supervision of my advisor, Prof. Jerzy Weyman.