Codimension two singularities of orbit closures for representations of tame quivers

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Let k be an algebraically closed field, $Q = (Q_0, Q_1, s, e)$ be a quiver and $\mathbf{d} = (d_i) \in \mathbb{N}^{Q_0}$ be a dimension vector. The representations $M = (M_i, M_\alpha)_{i \in Q_0, \alpha \in Q_1}$ of Q with fixed vector spaces $M_i = k^{d_i}$, $i \in Q_0$, form an affine space denoted by $\mathrm{rep}_Q(\mathbf{d})$. The group $\mathrm{GL}(\mathbf{d}) = \prod_{i \in Q_0} \mathrm{GL}_{d_i}(k)$ acts on $\mathrm{rep}_Q(\mathbf{d})$ by

$$(g_i)_{i \in Q_0} \star (M_\alpha)_{\alpha \in Q_1} = (g_{e(\alpha)} \cdot M_\alpha \cdot g_{s(\alpha)}^{-1})_{\alpha \in Q_1}.$$

Then the orbits correspond to isomorphism classes of representations. Let M be a representation in $\mathrm{rep}_Q(\mathbf{d})$ and $\mathcal{X} = \overline{\mathrm{GL}(\mathbf{d}) \star M}$ be the (Zariski) closure of the orbit $\mathrm{GL}(\mathbf{d}) \star M$. The aim of this talk is to present some results concerning codimension two singularities occurring in $\mathcal{X}$, especially if Q is a Dynkin or Euclidean quiver.

References

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[2] G. Zwara, *Singularities of orbit closures in module varieties and cones over rational normal curves*, (preprint: http://arxiv.org/abs/math.AG/0507593).