

Normal singularities with torus action.

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**Abstract**

This is a joint work with H. Süß. [arXiv:1005.2462 \[math.AG\]](https://arxiv.org/abs/1005.2462). A  $T$ -variety is a normal variety endowed with a regular action of the algebraic torus  $T$ . In the first part of this talk, we present a combinatorial description of affine  $T$ -varieties due to Altmann and Hausen. This description generalizes the usual description of affine toric varieties via polyhedral cones. Next, for every  $T$ -variety  $X$  we describe in these terms the class group of  $X$  and we give a partial desingularization  $\phi : Z \rightarrow X$  with  $Z$  a toroidal variety. In the second part of this talk, we apply the partial desingularization  $\phi$  to characterize the singularities of  $X$ . In particular, we give a criterion for  $X$  to have only rational singularities.