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Towards combinatorics of resolution of singularities

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Abstract

Resolution of singularities is an important tool in studying isomorphism classes of varieties in birational geometry. Works of Du Val(1934) has classified certain isolated surface singularities by ADE type Dynkin diagrams through representing their resolution of singularities in a graph theoretic way. These singularities are known as Du Val singularities or rational double points. Our focus in this talk will be rational triple and quadruple(Tosun) points, which are also classified respectively by Artin(1966) and Tosun through certain graphs. Our goal is to find combinatorial and/or algorithmic methods for obtaining explicit equations of surfaces admitting a singularity given its resolution graph. This is ongoing work with Meral Tosun and Zafeirakis Zafeirakopoulos.

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