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On the configuration of the singular fibers of jet schemes of rational double points. (English)
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Summary: To each variety $X$ and a nonnegative integer $m$, there is a space $X_m$ over $X$, called the jet scheme of $X$ of order $m$, parametrizing $m$-th jets on $X$. Its fiber over a singular point of $X$ is called a singular fiber. For a surface with a rational double point, Mourtada gave a one-to-one correspondence between the irreducible components of the singular fiber of $X_m$ and the exceptional curves of the minimal resolution of $X$ for $m \gg 0$. In this article, for a surface $X$ over $\mathbb{C}$ with a singularity of $A_n$ or $D_4$-type, we study the intersections of irreducible components of the singular fiber and construct a graph using this information. The vertices of the graph correspond to irreducible components of the singular fiber and two vertices are connected when the intersection of the corresponding components is maximal for the inclusion relation. In the case of $A_n$ or $D_4$-type singularity, we show that this graph is isomorphic to the resolution graph for $m \gg 0$.

MSC:
14J17 Singularities of surfaces or higher-dimensional varieties
14B05 Singularities in algebraic geometry

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jet scheme; rational double point singularities

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