

On the class of caustics by reflection of planar curves

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Abstract. Given any light position $S \in \mathbb{P}^2$ and any algebraic curve \mathcal{C} of \mathbb{P}^2 (with any kind of singularities), we consider the incident lines coming from S (*i.e.* the lines containing S) and their reflected lines after reflection on the mirror curve \mathcal{C} . The caustic by reflection $\Sigma_S(\mathcal{C})$ is the Zariski closure of the envelope of these reflected lines. We introduce the notion of reflected polar curve and express the class of $\Sigma_S(\mathcal{C})$ in terms of intersection numbers of \mathcal{C} with the reflected polar curve, thanks to a fundamental lemma established in [16]. This approach enables us to state an explicit formula for the class of $\Sigma_S(\mathcal{C})$ in every case in terms of intersection numbers of the initial curve \mathcal{C} .

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