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FOLIATIONS IN ALGEBRAIC SURFACES HAVING A RATIONAL FIRST INTEGRAL

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Abstract

Given a foliation $\mathcal{F}$ in an algebraic surface having a rational first integral a genus formula for the general solution is obtained. In the case $S = \mathbb{P}^2$ some new counter-examples to the classic formulation of the Poincaré problem are presented. If S is a rational surface and $\mathcal{F}$ has singularities of type $(1, 1)$ or $(1, -1)$ we prove that the general solution is a non-singular curve.

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