

INVARIANT HYPERPLANES AND DARBOUX INTEGRABILITY FOR d -DIMENSIONAL POLYNOMIAL DIFFERENTIAL SYSTEMS (*)

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ABSTRACT. – For a class of polynomial differential systems of degree $(m_1, \dots, m_d)$ in $\mathbf{R}^d$ which is open and dense in the set of all polynomial differential systems of degree $(m_1, \dots, m_d)$ in $\mathbf{R}^d$, we study the maximal number of invariant hyperplanes. This is a well known problem in dimension $d = 2$ (see for instance [1,12,16]). Furthermore, using the Darboux theory of integrability we analyse when can be possible to find a first integral of a polynomial vector field of degree $(m_1, \dots, m_d)$ in $\mathbf{R}^d$ by knowing the existence of a sufficient number of invariant hyperplanes. © 2000 Éditions scientifiques et médicales Elsevier SAS

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