Darboux theory of integrability on the Clifford n-dimensional torus

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A R T I C L E   I N F O

A B S T R A C T

For the polynomial vector fields on a Clifford n-dimensional torus, we develop a Darboux theory of integrability. Moreover, we study the optimal maximum number of invariant meridians in terms of the degree of the polynomial vector field.

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1. Introduction and statement of the main results

Nonlinear ordinary differential equations are vastly used to model processes in many fields. First integrals are important in particular because they help to obtain the phase portrait of the system and to reduce the dimension of the system by its number of independent first integrals. For all this, the corresponding methods are very important.

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