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On a unified formulation of completely integrable systems

Răzvan M. Tudoran

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The purpose of this article is to show that a \frac{C}^1 differential system on R^n which admits a set of n-1 independent \frac{C}^2 conservation laws defined on an open subset $\operatorname{C}^0 R^n$, is essentially \frac{C}^1 equivalent on an open and dense subset of C^1 , with the linear differential system $u^{prime_1=u_1}$, $u^{prime_2=u_2,..., u^prime_n=u_n}$. The main results are illustrated in the case of two concrete dynamical systems, namely the three dimensional Lotka-Volterra system, and respectively the Euler equations from the free rigid body dynamics.

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