

Coupling constant metamorphosis as an integrability-preserving transformation for general finite-dimensional dynamical systems and ODEs

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Abstract:

We extend the multiparameter coupling constant metamorphosis, also known as the generalized Stackel transform, from Hamiltonian dynamical systems to general finite-dimensional dynamical systems and ODEs. This transform interchanges the values of integrals of motion with the parameters these integrals depend on but leaves the phase space coordinates intact. Sufficient conditions under which the transformation in question preserves integrability and a simple formula relating the solutions of the original system to those of the transformed one are given. Further details can be found in the paper A. Sergyeyev, *Phys. Lett. A* 376 (2012), no.28-29, 2015-2022.