Computing necessary integrability conditions for planar parametrized homogeneous potentials

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We consider a potential V, rational homogeneous in dimension 2 with parameters a. We design an algorithm in [1] that computes polynomial necessary conditions on the parameters a such that the dynamical system associated to V is integrable. These conditions originate from those of the Morales-Ramis-Simó integrability criterion [2, 3] near all Darboux points. The implementation of the algorithm allows to treat applications that were out of reach before, as high degree homogeneous polynomials and the non integrability proof of the colinear three body problem.

Bibliographie

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