Polynomial integrability of the Hamiltonian systems with homogeneous potential of degree −2

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Abstract

We characterize the analytic integrability of Hamiltonian systems with Hamiltonian $H = \dfrac{1}{2}\sum_{i=1}^{2} p_i^2 + V(q_1, q_2)$, having homogeneous potential $V(q_1, q_2)$ of degree -2.