

POLYNOMIAL INTEGRABILITY OF THE  
HAMILTONIAN SYSTEMS WITH HOMOGENEOUS  
POTENTIAL OF DEGREE  $-2$

Jaume Llibre, Adam Mahdi and Claudia Valls

Preprint no. 2011-05

**Abstract**

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

*2000 AMS Subject Classification:* Primary: 37J35; Secondary: 34Cxx.

**Key words and phrases:** Center problem, center manifold, integrability.