Seminário de sistemas dinâmicos e estocásticos

Departamento de Matemática - IMECC - UNICAMP

Conditions to the existence of center-focus in planar systems and center for Abel equations

Alexandre Miranda Alves
Universidade Federal de Viçosa

Resumo:

Abel equations of the form $x(t) = f(t)x^3(t) + g(t)x^2(t)$, $t \in [a, a]$, where a ¿ 0 is a constant, f and g are continuous functions, are of interest because of their close relation to planar vector fields. If f and g are odd functions we prove that the Abel equation has a center at the origin. We also consider a class of polynomial differential equations $x = -y + P_n(x, y)$ and $\dot{y} = x + Q_n(x, y)$, where P_n and Q_n are homogeneous polynomials of degree n. Using the results obtained for Abels equation we obtain a new subclass of systems having a center and another subclass having a focus at the origin.

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