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INTEGRABILITY OF A LINEAR CENTER PERTURBED BY A FIFTH DEGREE HOMOGENEOUS POLYNOMIAL*

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Abstract

In this work we study the integrability of two-dimensional autonomous system in the plane with linear part of center type and non-linear part given by homogeneous polynomials of fifth degree. We give a simple characterisation for the integrable cases in polar coordinates. Finally we formulate a conjecture about the independence of the two classes of parameters which appear on the system; if this conjecture is true the integrable cases found will be the only possible ones.

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