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THE NULL DIVERGENCE FACTOR

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Abstract

Let (P, Q) be a C^1 vector field defined in a open subset $U \subset R^2$. We call a null divergence factor a C^1 solution $V(x, y)$ of the equation $P\frac{\partial V}{\partial x} + Q\frac{\partial V}{\partial y} = \left(\frac{\partial P}{\partial x} + \frac{\partial Q}{\partial y}\right) V$. In previous works it has been shown that this function plays a fundamental role in the problem of the center and in the determination of the limit cycles. In this paper we show how to construct systems with a given null divergence factor. The method presented in this paper is a generalization of the classical Darboux method to generate integrable systems.

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