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On the existence of a Lagrangian for a system of ordinary differential equations.

*Mat. Metody Fiz.-Mekh. Polya* 13, 34-38 (Russian) (1981).

The problem, whether an autonomous system of ordinary differential equations of arbitrary order can represent an Euler-Poisson equation system is investigated. A necessary and sufficient condition of a positive answer to this question is obtained in the form of equations containing derivatives of the coefficients of the original equations. As a special application, the general form of Euler-Poisson equations of third order is obtained and the necessary and sufficient conditions of the above-mentioned question for third-order ordinary differential equation systems are obtained in the form of explicit algebraic equations for the coefficients.

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