BOHLIN'S LIKE INTEGRALS FOR NONCONSERVATIVE DYNAMICAL SYSTEMS

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It is generally accepted that the existence of the first integrals (conservation laws) lightens up the study of the motion of a dynamical system. Consequently, many methods have been developed in order to obtain these important relations.

The purpose of this paper is to show how to obtain the first integrals of nonconservative dynamical systems by means of a field method. The field method has been formulated as a method of exact and approximate integration of a system of ordinary differential equation, akin to the wellknown Hamilton-Jacobi method in conservative analytical mechanics. Its fundamental supposition is that the basic field of the theory can be taken from the set of quantities which are directly involved in the process of motion of the dynamical system. This idea yields to a quasi-linear partial differential equation, so-called basic field equation. Thus, instead of trying to integrate the ordinary system of differential equations of motion, we try to find a complete solution of the basic field equation. The first integrals and motion of the dynamical system then follow immediately from this complete solution by simple mathematical operation which do not involve any integration.