On the geometric formulation of the notions of particular integral and particular integrability in Classical Mechanics

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Abstract

In this talk it is presented the notions of particular integral and particular integrability, within the geometric framework of Classical Hamiltonian Mechanics on symplectic and contact manifolds. In general terms, a particular integral is a quantity that is conserved possibly only on a dynamical invariant submanifold of the phase-space; the notion of particular integrability allows the integrability by quadratures of the equations of motion in certain region of the phase-space where a sufficient amount of conserved quantities (particular integrals) are found. In the special case of contact Hamiltonian systems, which describe dissipative systems, the so called dissipated quantities are particular integrals, they allow a reduction of the equations of motion, and in the particular case of the so called "good" contact Hamiltonian systems, we could have particular integrability.