

New methods of integration of equations of non-holonomic mechanics

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In this paper we consider classical and new problems of non-holonomic mechanics. Additional integrals and invariant measure are found. We discuss problems of explicit solutions by quadratures with investigation of different classes of special functions. The main idea of these methods is the development of Chaplygin's reducing multiplier, after appropriate change of time, of a non-holonomic problem to the Hamiltonian form. We also indicate isomorphisms between some non-holonomic problems and classical cases of integrability in rigid body dynamics (Klebsh's case, etc.)