1052-70-311 **Tomoki Ohsawa*** (ohsawa@umich.edu), 530 Church St, Department of Mathematics, University of Michigan, Ann Arbor, MI 48109, and **Anthony Michael Bloch** (abloch@umich.edu), 530 Church St, Department of Mathematics, University of Michigan, Ann Arbor, MI 48109.

Nonholonomic Hamilton–Jacobi Equation and Integrability.

We discuss an extension of the Hamilton–Jacobi theory to nonholonomic mechanics with a particular interest in its application to exactly integrating the equations of motion. We give a nonholonomic version of the geometric Hamilton–Jacobi theorem with a geometric interpretation of the conditions arising from nonholonomic constraints. In particular, we build on previous works on nonholonomic Hamilton–Jacobi theory so that the conventional method of separation of variables applies to integrating equations of motion of some nonholonomic mechanical systems. We also show a way to apply our result to a system to which separation of variables does not apply. (Received August 31, 2009)