

Year: 2014	Vol.: 84	Fasc.: 1-2
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Title: Lepage forms in Kawaguchi spaces and the Hilbert form

Author(s): Demeter Krupka

A well-known construction in geometric mechanics and Riemann -Finsler geometry assigns to a (first order) homogeneous Lagrangian the Hilbert form, serving as an integrand in the corresponding variational functional. Analogous constructions, needed for higher-order mechanics and Finsler-Kawaguchi geometry, have not been found yet. In this paper we construct Lepage equivalents of Lagrangians, satisfying higher-order homogeneity (Zermelo) condition. We show that the homogeneity determines uniquely higher-order momenta and annihilates local Hamiltonians. The resulting Lepage equivalents then represent higher-order generalizations of the Hilbert form. This result extends geometric foundations of variational theory to higher-order parameter-invariant variational functionals.

Address:

Demeter Krupka
Lepage Research Institute
783 42 Slatinice
Czech Republic
and
School of Mathematics
Beijing Institute of Technology
5 South Zhongguancun Street
Haidian Zone, Beijing 100081
China
and
Department of Mathematics
The University of Ostrava
70103 Ostrava
Czech Republic