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Matsyuk, Roman (UKR-AOS-A2)
Towards the physical significance of the $(k^2+A)\|u\|$ metric. (English summary)
Tensor (N.S.) **71** (2009), *no. 2,* 109–113.

In 1972, F. Riewe proposed a system of fourth-order ordinary differential equations for the description of the semi-classical "Zitterbewegung" of a classical test particle in flat space-time with an internal degree of freedom [Nuovo Cimento B **8** (1972), no. 1, 271–277, doi:10.1007/BF02743522]. Recently, the present author has shown that these equations are derivable from a variational principle with Lagrangian function $L^k = (k^2 + A)\|u\|$, expressed in terms of the world-line Frenet curvature k, under a given constraint. Here, $u = (u^i)$ are the derivatives of the space-time coordinates x^i with respect to the evolution parameter along the particle's world-line.

The purpose of the present paper is to derive a generalization of Riewe's equations from a variational principle with Lagrangian L^k in the (pseudo-)Riemannian case. In this way, a generalization is obtained of the flat space-time model of a semi-classical spinning particle to the pseudo-Riemannian framework. A space endowed with a metric function of the form L^k is an example of a so-called Kawaguchi space. *Frans Cantrijn*