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# The autoparallel equations with non-metricity as Finsler geodesics

Autoparallel curves in metric-affine geometries are generally non-variational and do not generally coincide with the Euler-Lagrange equations of any Lagrangian. For symmetric connections with vectorial nonmetricity, we show that the autoparallel equations can be realized as geodesics of a suitably chosen Finsler metric, reducing the problem of variationality to Finsler metrizability. By formulating this as a first-order partial differential equation, we obtain necessary and sufficient conditions and classify all $(\alpha, \beta)$-metrics whose geodesics coincide with these autoparallels. For generalized $(\alpha, \beta)$-metrics, necessary conditions are obtained.

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