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**Affine and projective vector fields on spray manifolds.** (English) Zbl 1067.53059  
Period. Math. Hung. 48, No. 1-2, 165-179 (2004).

Summary: We present necessary and sufficient conditions for a vector field on a spray manifold to be affine or projective. Among others, we show that a vector field  $X$  on a spray manifold  $(M, \xi)$  is affine if and only if  $[X^c, \xi] = 0$ , which holds if and only if the Lie derivative of Berwald's covariant derivative with respect to  $X^c$  vanishes. The vector field  $X$  is projective if and only if  $[X^c, \xi]$  is the Liouville vector field multiplied by some smooth function. Other characterizations of affine and projective vector fields include expressions containing the Lie derivative of Yano's covariant derivative, the induced horizontal projector with respect to  $X^c$ , as well as the curvature tensors of Berwald's derivative.

**MSC:**

- 53C60 Global differential geometry of Finsler spaces and generalizations (areal metrics) Cited in **6** Documents
- 34A26 Geometric methods in ordinary differential equations
- 34C40 Ordinary differential equations and systems on manifolds

**Keywords:**

spray geometry; infinitesimal transformations; Lie derivatives

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