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# Carnot-Carathéodory空间中的变换论

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**摘要** Klein发表著名的埃兰根纲领,由群论角度研究了空间变换群的不变量,从而引进了各种不同的几何学. 本文利用Felix Klein 的观念,研究Carnot--Carathéodory空间  $\{M, Q, g\}$  (又称为次黎曼流形)上的类似问题, 给出了次黎曼流形中的共形不变量和射影不变量. 本文给出的共形和射影不变量可视为黎曼情形的一种自然推广. 由于次黎曼流形与黎曼流形之间有着本质的差异, 故此, 本文通过次黎曼流形上存在的唯一非完整 联络 (Nonholonomic connections)来刻画所提的问题.

**关键词** [Carnot--Carathéodory空间](#) [次黎曼流形](#) [变换群](#)

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## Transform Theories in Carnot--Carathéodory Spaces

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**Abstract** The celebrated Erlangen program given by Klein, describing the invariant of transform group in Euclidean space, has introduced some different geometries such as Affine Geometry, Conformal Geometry, etc. The authors will focus their attention on similar problems in Sub-Riemannian manifolds (i.e. Carnot--Carathéodory  $\{M, Q, g\}$ ) with the view of Felix Klein, and obtain some interesting invariants, for instance, conformal invariants and projective invariants. These results can be regarded as natural generalizations of those conclusions in Euclidean setting. Because of the essential difference between Sub-Riemannian manifolds and Riemannian manifolds, so that, we wish to use the unique non-holonomic connection to solve the posed problems.

**Key words** [Carnot--Carathéodory spaces](#) [sub-Riemannian manifolds](#) [transform groups](#)

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