

Projective Lichnerowicz-Obata Conjecture

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Abstract

I will prove the following classical conjecture: Let a connected Lie group act on a complete Riemannian manifold by transformations that take (unparameterized) geodesics to geodesics. Then, it acts by affine transformations, or the manifold can be covered by the round sphere. The methods of proof came from geometric partial differential equation and integrable systems: if Lie group preserves geodesics, a certain system of partial differential equations is fulfilled. We analyse this system with the help of integrable systems.