

Geometry of loop spaces

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A Riemannian metric on a manifold M induces a family of Riemannian metrics on the loop space LM depending on a Sobolev space parameter s . We compute the connection forms of these metrics and the higher symbols of their curvature forms, which take values in pseudodifferential operators (Ψ DOs). These calculations are used to construct Chern-Simons classes on TLM which detect nontrivial elements in the diffeomorphism group of certain Sasakian 5-manifolds associated to Kähler surfaces.
