

Notes on Feynman path integral-like methods of quantization on Riemannian manifolds

Yoshihisa Miyanishi

Center for the Study of Finance and Insurance, Osaka University
Machikaneyamacho 1-3, Toyonakashi
Japan
miyanishi@sigmath.es.osaka-u.ac.jp

An alternative method for Feynman path integrals is discussed. Our method employs action integrals along the shortest paths on a Riemannian manifold. Oscillatory integrals $U(t)$ are defined by the action integrals and Van Vleck determinant. Under these circumstances, we show the strong convergence of time slicing products of $U(t)$ for low energy functions. Moreover, the strong limits include Dewitt curvature $R/12$, where R denotes the scalar curvature of a Riemannian manifold. This is an alternative rigorous formulation for Feynman path integrals on Riemannian manifolds.