Zeta-regularization and calculus on infinite dimensional spaces

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Abstract

In the calculus of infinite dimensional geometry and analysis,we often meet the problem of divergence. For example, div. of a vector function contains infinite sum, so may diverges. To overcome this difficulty, a systematic way of application ofzeta-regularization was proposed (Asada, A.: Regularized Calculus: An application of zeta-regularization to infinitedimensional geometry and analysis, to appear in Int. J. Geo. Meth. of Math. Physics). In this talk, taking mathematical justification of the appearance of Ray-Singer determinant in the calculation of Gaussian Path integral as the example, regularized calculus is explained.