Stochastic analysis on configuration spaces: basic ideas and recent results

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Abstract

The purpose of this paper is to provide a both comprehensive and summarizing account on recent results about analysis and geometry on configuration spaces Γ_X over Riemannian manifolds X. Particular emphasis is given to a complete description of the so–called "lifting–procedure", Markov resp. strong resp. L^1–uniqueness results, the non–conservative case, the interpretation of the constructed diffusions as solutions of the respective classical "heuristic" stochastic differential equations, and a self–contained presentation of a general closability result for the corresponding pre–Dirichlet forms. The latter is presented in the general case of arbitrary (not necessarily pair) potentials describing the singular interactions. A support property for the diffusions, the intrinsic metric, and a Rademacher theorem on Γ_X, recently proved, are also discussed.

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