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cost inequality; 2.5.1 From super Poincare to weighted log-Sobolev inequalities; 2.5.2 From log-Sobolev to transportation-cost inequalities; 2.5.3 From super Poincare to transportation-cost inequalities; 2.5.4 Super Poincare inequality by perturbations; 2.6 Log-Sobolev inequality: Different roles of Ric and Hess; 2.6.1 Exponential estimate and concentration of; 2.6.2 Harnack inequality and the log-Sobolev inequality
2.6.3 Hypercontractivity and ultracontractivity2.7 Curvature-dimension condition and applications; 2.7.1 Gradient and Harnack inequalities; 2.7.2 HWI inequalities; 2.8 Intrinsic ultracontractivity on non-compact manifolds; 2.8.1 The intrinsic super Poincare inequality; 2.8.2 Curvature conditions for intrinsic ultracontractivity; 2.8.3 Some examples; 3. Reflecting Diffusion Processes on Manifolds with Boundary; 3.1 Kolmogorov equations and the Neumann problem; 3.2 Formulae for Pt, RicZ and I; 3.2.1 Formula for Pt; 3.2.2 Formulae for RicZ and I; 3.2.3 Gradient estimates
3.3 Equivalent semigroup inequalities for curvature conditionand lower bound of I3.3.1 Equivalent statements for lower bounds of RicZ and I; 3.3.2 Equivalent inequalities for curvature-dimension condition and lower bound of I; 3.4 Harnack inequalities for SDEs on Rd and extension to nonconvex manifolds; 3.4.1 Construction of the coupling; 3.4.2 Harnack inequality on Rd; 3.4.3 Extension to manifolds with convex boundary; 3.4.4 Neumann semigroup on non-convex manifolds; 3.5 Functional inequalities; 3.5.1 Estimates for inequality constants on compact manifolds
3.5.2 A counterexample for Bakry-Emery criterion

Sommario/riassunto

Stochastic analysis on Riemannian manifolds without boundary has been well established. However, the analysis for reflecting diffusion processes and sub-elliptic diffusion processes is far from complete. This book contains recent advances in this direction along with new ideas and efficient arguments, which are crucial for further developments. Many results contained here (for example, the formula of the curvature using derivatives of the semigroup) are new among existing monographs even in the case without boundary.