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Nota di contenuto	Kohn's Proof of the Hypoellipticity of the Hörmander Operators -- Compactness Criteria for the Resolvent of Schrödinger Operators -- Global Pseudo-differential Calculus -- Analysis of some Fokker-Planck Operator -- Return to Equillibrium for the Fokker-Planck Operator -- Hypoellipticity and Nilpotent Groups -- Maximal Hypoellipticity for Polynomial of Vector Fields and Spectral Byproducts -- On Fokker-Planck Operators and Nilpotent Techniques -- Maximal Microhypoellipticity for Systems and Applications to Witten Laplacians -- Spectral Properties of the Witten-Laplacians in Connection with Poincaré Inequalities for Laplace Integrals -- Semi-classical Analysis for the Schrödinger Operator: Harmonic Approximation -- Decay of Eigenfunctions and Application to the Splitting -- Semi-classical Analysis and Witten Laplacians: Morse Inequalities -- Semi-classical Analysis and Witten Laplacians: Tunneling Effects -- Accurate Asymptotics for the Exponentially Small Eigenvalues of the Witten Laplacian -- Application to the Fokker-Planck Equation -- Epilogue -- Index.
Sommario/riassunto	There has recently been a renewal of interest in Fokker-Planck operators, motivated by problems in statistical physics, in kinetic equations and differential geometry. Compared to more standard problems in the spectral theory of partial differential operators, those operators are not self-adjoint and only hypoelliptic. The aim of the

analysis is to give, as generally as possible, an accurate qualitative and quantitative description of the exponential return to the thermodynamical equilibrium. While exploring and improving recent results in this direction this volume proposes a review of known techniques on: the hypoellipticity of polynomial of vector fields and its global counterpart; the global Weyl-Hörmander pseudo-differential calculus, the spectral theory of non-self-adjoint operators, the semi-classical analysis of Schrödinger-type operators, the Witten complexes and the Morse inequalities.