Global hypoellipticity and compactness of resolvent for Fokker-Planck operator

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Abstract. In this paper we study the Fokker-Planck operator with potential $V(x)$, and analyze some kind of conditions imposed on the potential to ensure the validity of global hypoelliptic estimates (see Theorem 1.1). As a consequence, we obtain the compactness of resolvent of the Fokker-Planck operator if either the Witten Laplacian on 0-forms has a compact resolvent or some additional assumption on the behavior of the potential at infinity is fulfilled. This work improves the previous results of Hérau-Nier [5] and Helffer-Nier [3], by obtaining a better global hypoelliptic estimate under weaker assumptions on the potential.