

# Stability characterization, cutoff phenomenon and Eyring-Kramers estimates for the Langevin dynamics

Mouad Ramil

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In this talk we will present some recent results obtained on the Langevin dynamics. First we shall detail a criterion ensuring global stability for the Langevin dynamics with general non-conservative forces. We will see that this criterion is almost-sharp as it is a necessary and sufficient condition in the case when the force is linear with a normal matrix. Assuming this criterion, we will be able to extend previous work by Barrera, Jara on the overdamped Langevin dynamics regarding the existence of a cutoff phenomenon in the convergence to equilibrium, to the case of the Langevin dynamics. Finally, we will conclude this presentation by extending the well-known Eyring-Kramers estimates to the case of the Langevin dynamics. This is a joint work with Seungwoo Lee and Insuk Seo.