ON ERGODICITY OF INVARIANT MEASURES FOR THE STOCHASTIC LANDAU-LIFSCHITZ-GILBERT EQUATION IN $1D$

E. Gussetti[1]

[1]Bielefeld University, Bielefeld, Germany

egussetti@math.uni-bielefeld.de

The Landau-Lifshitz-Gilbert equation describes the behaviour of a ferromagnetic material on a bounded domain D. In this talk I will present a result concerning the existence of an invariant measure in $H^1(D, \mathbb{R}^3) \cap L^2(D, \mathbb{S}^2)$ for the stochastic Landau-Lifschitz-Gilbert equation on a one dimensional interval. The conclusion is achieved by employing the classical Krylov-Bogoliubov theorem and by means of rough paths techniques. We stress that rough path theory is necessary to achieve the Feller property in the strong norm. We remark also that the estimates in the tightness step are non-standard, due to the manifold constraint. In some specific cases, we show that there exists a unique Gibbs invariant measure and we establish the qualitative behaviour of the unique stationary solution. We also discuss how the choice of the noise influences the uniqueness of an invariant measures. The talk is based on [1].

1. Gussetti E. On ergodic invariant measures for the stochastic Landau-Lifschitz-Gilbert equation in $1D$. https://arxiv.org/abs/2208.02136, 2022, 32 p.