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Intermittency in a parametrically driven magnetic particle

Friday 2 October 2020 10:00 (30 minutes)

In this work, we study the magnetization dynamics of an anisotropic particle subjected to a time dependent magnetic field. We use the dissipative Landau–Lifshitz–Gilbert equation to model the magnetization dynamics. To perform the characterization, we compute the Lyapunov exponents and the isospikes diagrams in two-dimensional phase diagrams of the parameter space of the particle. We observe multiple transitions among periodic states, revealing complex topological structures in the parameter space typical of dynamical systems [1]. To elucidate the finer details of the observed regular structures, iterative zooms are performed in the two-dimensional phase diagrams. In particular, we find islands of synchronization for the magnetization and the driven field. We have also detected and several shrimp structures with different periods. Finally, we show that there is a route towards chaotic dynamics that is mediated by intermittency.

References
[1] J. A. Vélez et al., Chaos 30, 093112 (2020).

Is this abstract from experiment?

No

Internet talk

Yes

Name of experiment and experimental site

Is the speaker for that presentation defined?

No

Details

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