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The Impact of Adiabatic Invariants on the dynamics of the Fermi-Pasta-Ulam-Tsingou model

Helen Christodoulidi

School of Mathematics and Physics

University of Lincoln, UK

hchristodoulidi@lincoln.ac.uk

<https://staff.lincoln.ac.uk/5cd98247-81d8-44b5-90d6-84ae45e2a737>

Many-body dynamical systems with Hamiltonian structure describe a rich variety of physical systems and natural phenomena that range from atomic scale particles to celestial bodies. In recent years there has been an increasing interest in non-equilibrium phenomena which appear in such systems. In my talk I will focus on the celebrated Fermi-Pasta-Ulam-Tsingou (FPUT) model and its relevance to the integrable Toda lattice. In particular, it will be discussed the role of adiabatic invariants in the FPUT model and their potential impact on the system's dynamics. Moreover, adiabatic invariants can be used for identifying energy diffusion and measuring equilibrium times.

References

- [1] G Benettin, H Christodoulidi, A Ponno, *Journal of Stat Phys* **152**, 2 (2013).
- [2] Christodoulidi H. and Efthymiopoulos C., Stages of dynamics in the Fermi-Pasta-Ulam system as probed by the first Toda integral, *Mathematics in Engineering AIMS* **1**, 2 (2019).