Abstract Submitted
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Theoretical and experimental analysis of two different pendula whose common oscillating point is forced periodically[1] JORGE HERNANDEZ GOMEZ, ALESSIO PALAVICINI CRUZ, MARCO ANTONIO MARTINEZ, ALEJANDRO GONZALEZ Y HERNANDEZ[2], Facultad de Ciencias, UNAM — The behavior of a non-linear dynamical system is characterized both experimentally and theoretically. The system consists of two different pendula coupled through a low friction car that oscillates in response to a periodical force. This system is studied theoretically and experimentally in order to compare the results of each approach. All the system's parameters are fixed except the forcing frequency, which is changed within an interval that causes the system to respond. Theoretically, the system's equations have been settled and solved using numerical methods. Experimentally, the system was mounted and data was acquired by computer motion sensors. The three bodies of the system are studied: Lyapunov's exponents are used to identify chaos and stability regions for the forcing frequency changes; phase planes and spaces are plotted to identify periodical and erratic behaviors; Poincare mappings and Fourier transforms are used to identify frequencies in which remarkable behaviors arise. The similarities and differences between theoretical and experimental results are discussed.

[1]The oscilating point of both pendula is coupled with a low friction car.
[2]Advisor

Jorge Hernandez Gomez
Facultad de Ciencias, UNAM

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