

Simulation of a Ball Bouncing on a Sinusoidally Vibrating Plate
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For the past couple years I, along with my faculty advisor Dr. Scott Franklin, have been working on the non-linear system of a ball falling onto a vibrating plate. We used previously published equations for the air-dragged system to model the physical situation. However, our simulation expands on the old idea by including the coefficient of restitution. This addition causes a change in bifurcation and periodic motion due to the inelastic energy loss. Also, we investigate phenomena that occur only in inelastic conditions, such as periodic chattering down patterns. I will talk about the simulation, some of our interesting and unexpected findings, and our current attempts to create a stability analysis to match our data.