

Abstract Submitted
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The dynamics of the Malkus water wheel¹ ALISON SAUNDERS, RACHEL FORDYCE, LUCAS ILLING, Reed College — The Malkus water wheel is a mechanical system whose chaotic dynamics are described by the famous Lorenz equations. In our experiment, a continuous series of syringes are attached to a bicycle wheel that can be inclined. Water pours into the wheel at the wheel's top and tunable friction is introduced through magnetic inductance braking. We successfully generate fixed point, periodic, and chaotic motion by tuning the wheel parameters, such as the braking torque, the inflow rate, and the angle of inclination. Upon mapping the experimentally measured parameters onto those of the model, we find that the wheel's behavior agrees reasonably well with that of the Lorenz equation.

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