

The Effects of Ameliorating the Aerodynamics of a Simple Gravity Pendulum

Andy Yang

Practical Applications in Advance Mathematics

Amy Goodrum

University of North Carolina at Charlotte

Abstract

Pendulums have been used throughout history for various tasks. Its most renowned and practical role was serving as a tempo on pendulum clocks. Even though its role is now deceased by technology, its principles and function still oscillate in the field of physics. Real simple gravity pendulums process many defects that are avoided in the ideal mathematical models. One which is air drag, discussed later in the paper, leads to the focus of the experiment. It aroused the question “Will ameliorating the aerodynamics of the bob of a pendulum or adjusting the length of the rod help make a simple gravity pendulum’s periods more consistent? Figuring out that most of the air drag and friction is caused by the bob, I replaced the typical sphere ball with a design that combines the most aerodynamic shape a “tear drop” in two directions. This shape known as the prolate spheroid is the main variable tested in the following experiment. The additional variable being tested is the length of the rod and its relations to the periods of the pendulum. After conducting the experiment, I found no association between the shape of the bob or the length of the rod for small angled swings to the time it took to complete 10 consecutive individual periods.