

University Physics 1: PHYS221

Lab Exam 3: Momentum and Energy

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Background Information

In the early 1970's the interactions between particles as to why they stick together was unknown. People, including Leonard Susskind and Gerald t'Hooft, began to model the way particles "stick" and appear *spring-like*, as strings connecting particles together. However, the model had a massive flaw; it appeared that these strings can go out to infinity! But, a few unknown physicists began to instead create a more, down-to-earth model. This consisted of a grounded spring attached to a cart, which was attached to another mass by a physical-string hung over a pulley at some angle. Their idea was that since they can relate the gravitational force of the whole setup with respect towards how the string-model of particles above, then the gravitational pull of the hanging weight would represent a cutoff-distance in the string-model's behavior. *This was done by computing the height at which the second mass falls from when the spring was at it's **relaxed** length up to it's **maximum** stretch.*

1 The Lab

1. Task: To recreate the "down-to-earth" model that the researchers above used to predict the height.
2. Givens/measurable quantities & Unknowns:
 - a.) g ($9.8 \frac{N}{kg}$), mass of cart (grams/kg), mass of hanger (grams/kg), angle (θ), spring constant k ($\frac{N}{m}$).
 - b.) Recreate the model described above and predict the distance.