Measuring Gravity

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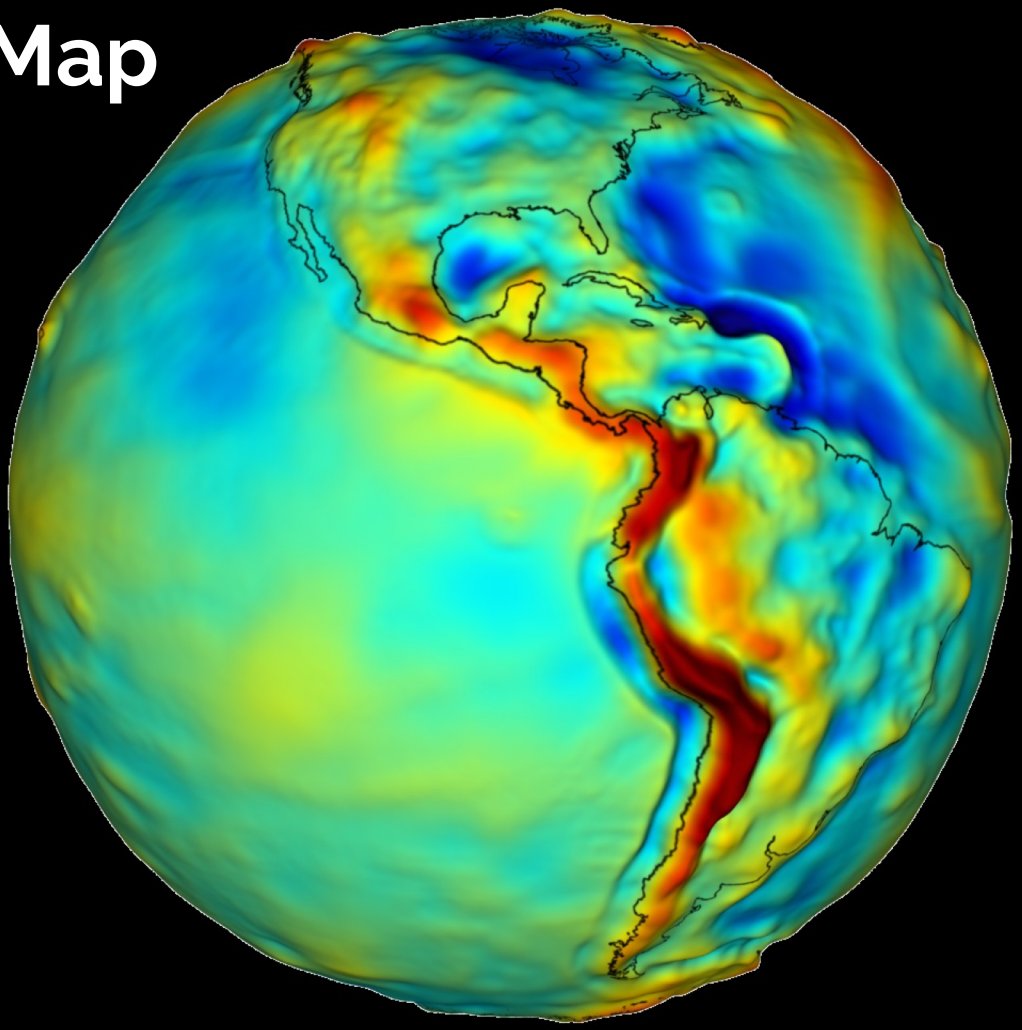
Gravity Map



Sharghi, Kayvon. “Mapping Earth's Gravity.” *NASA*, NASA, 23 Apr. 2013, nasaviz.gsfc.nasa.gov/11234.

Objectives

Create a system that:

Measures gravitational acceleration

Create 3D printed projectiles to drop and house sensor package

Has comparable to accuracy to current methods of calculations

Behr Free Fall Apparatus

Tracks position by creating spark ark to mark where it is on a paper.

Disadvantages

Sparks

Expensive

Our Design

Tracks position by sampling distance from infrared 100 times per second.

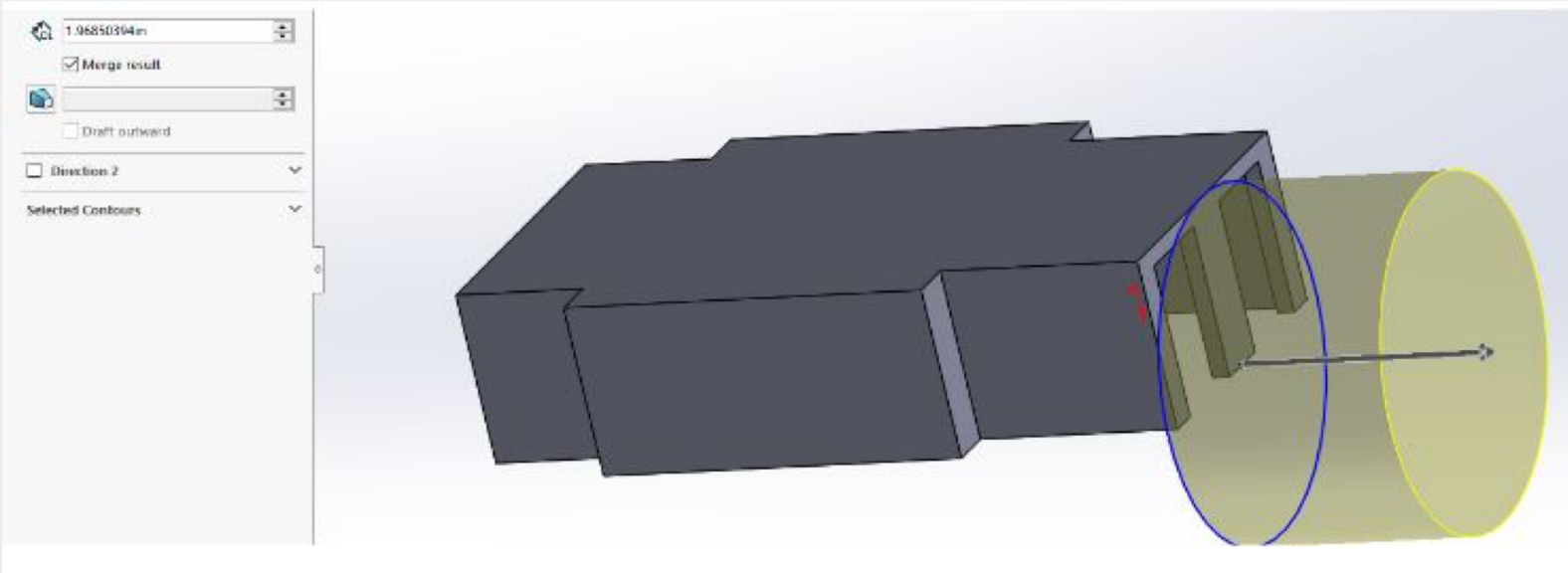
Disadvantages

Tall

Leveling difficulties

Cart Prototype

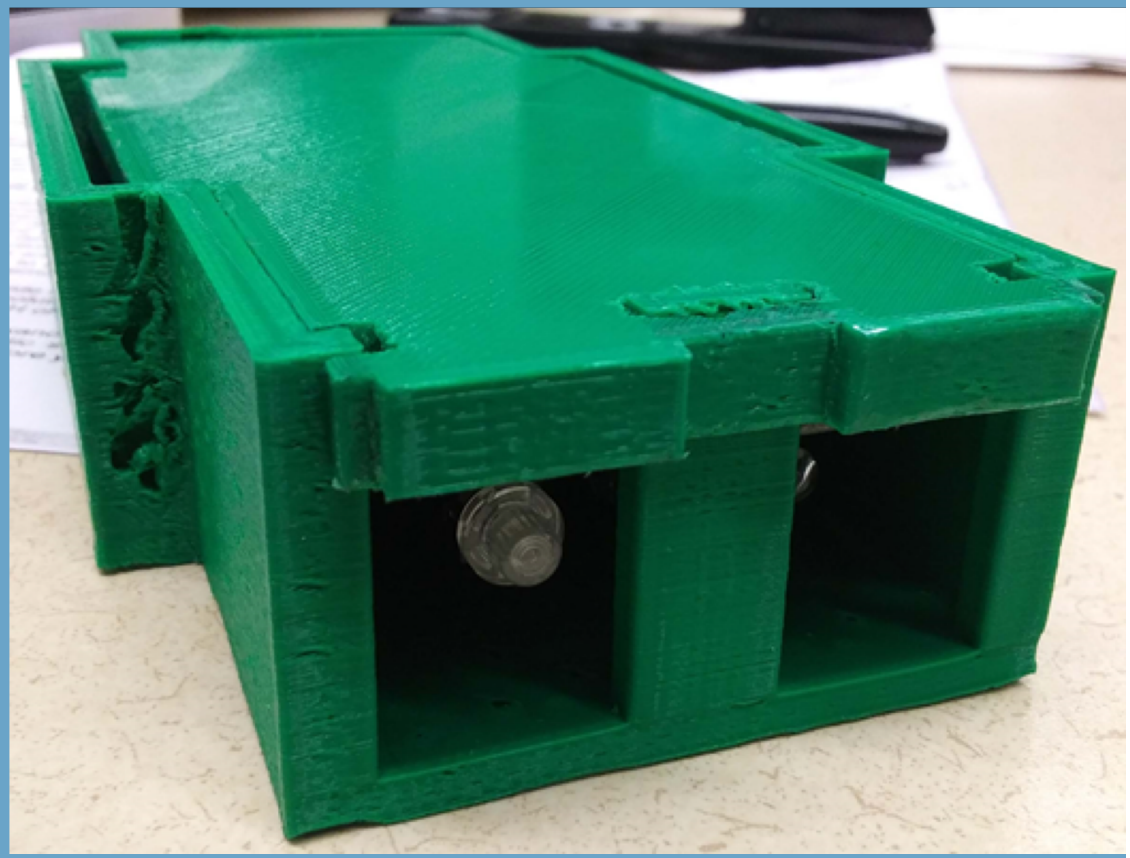
Initial idea - Dropping carts over and over again would make them break, so make them simple, and hopefully durable.



Cart Prototype

01

Built to last.



Cart Prototype

02

Aerodynamic Design, no case topping.

Drop Tower

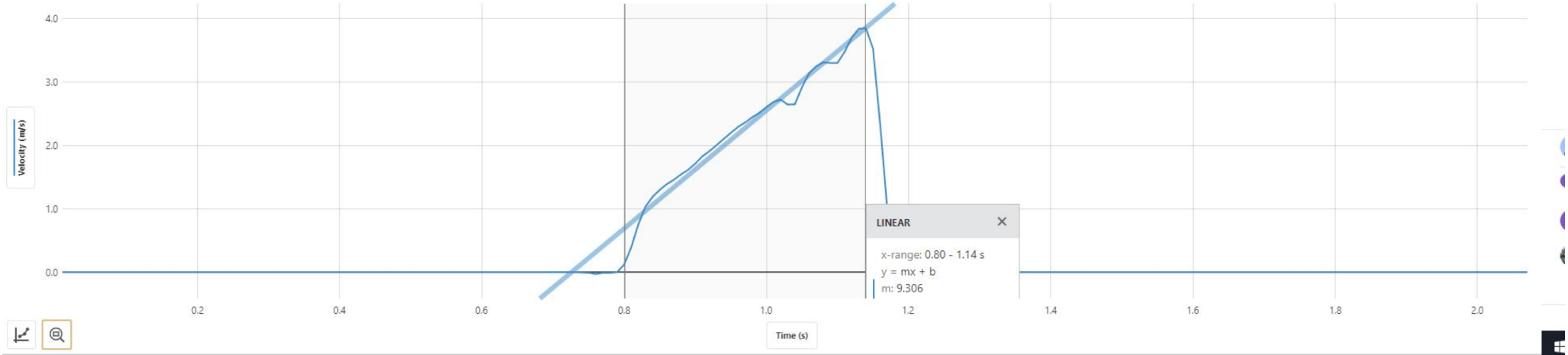
Provide framework for leveling.

Provide something to put sensor tape on.

First Data Trials

Reasonable value for g.

Unusual data later on.



Improved Drop Tower

Taller, more data.

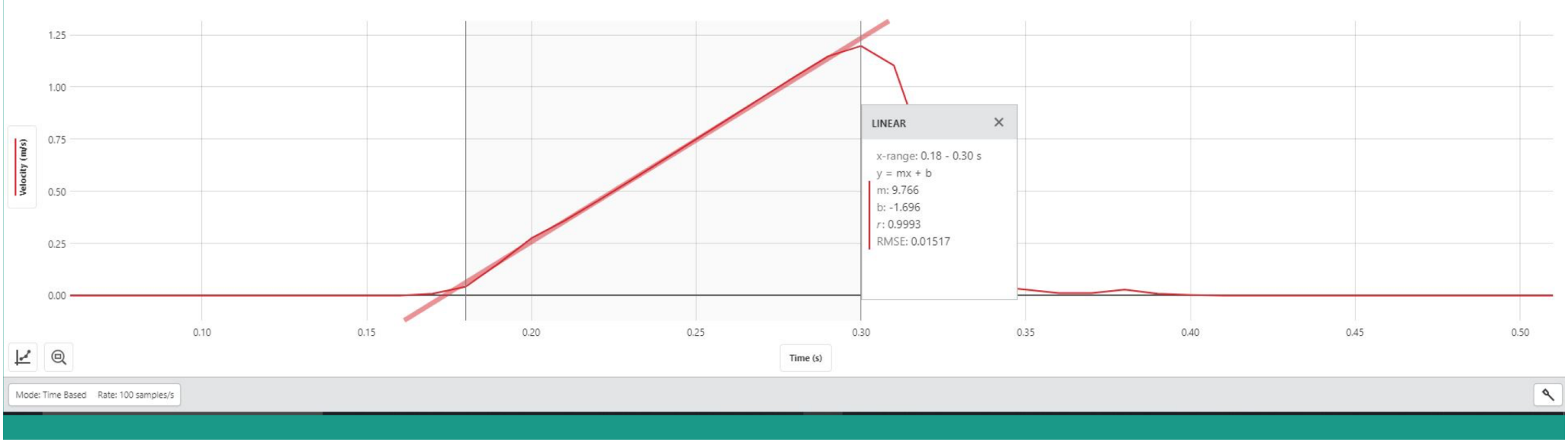
Metal, factory placed tape.

Fixed data errors.

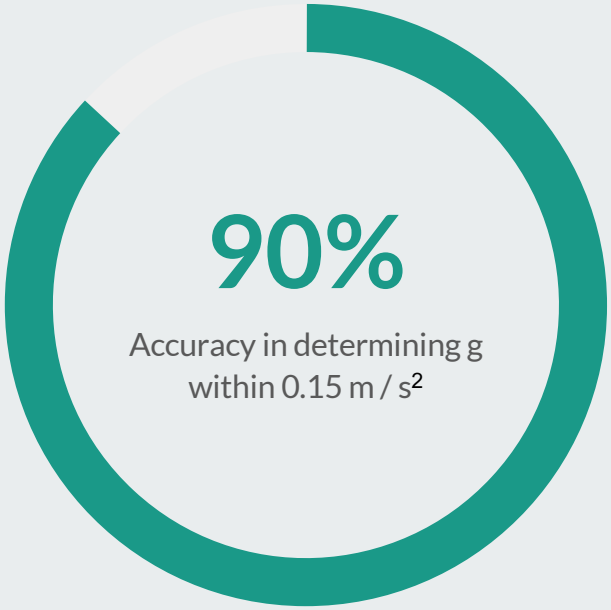
Latest Data Trials

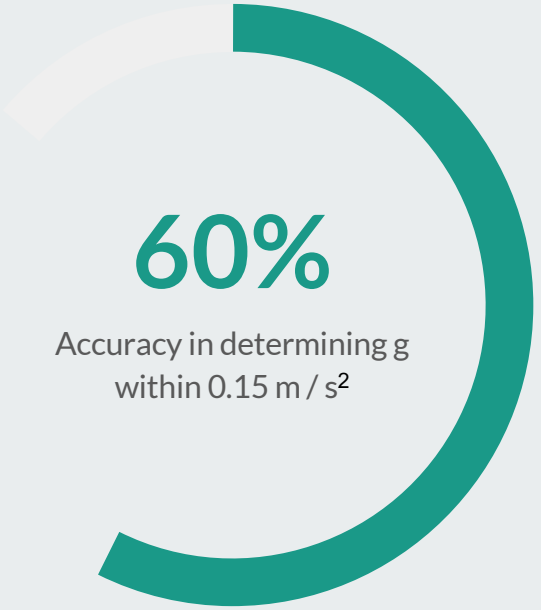
Much more reasonable value for g.

Cleaner slope, higher sample rate.



Data Obtained





Accepted Value for g, 9.8 m / s^2

What next?

- ➔ Continue to refine accuracy.
- ➔ Ensure reproducibility.
- ➔ Implement vacuum system.

References

NASA Gravity Map

Sharghi, Kayvon. “Mapping Earth's Gravity.” *NASA*, NASA, 23 Apr. 2013, nasaviz.gsfc.nasa.gov/11234.

Acknowledgements

Thank you to

My Partner Jacob Brauer

Our Mentor Toby Dittrich

Our source for questions on equipend, David Vernier

Supported by NASA SCORE Space Grant


Baxter

Questions?