ECE Senior Design Weekly Report

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Team Name: The Globetrotters Lab Section: 4

Week’s Task: Research levitation using rare earth magnets.

Results: It is very possible to levitate the globe without using electricity. This way we will only need to focus on feedback controls and keeping it perfectly stable when it is in the air. It might be a good idea to enclose the globe in a glass cause to prevent wind or other outside variables from making it move. I have found some magnets for fairly cheap that I think will do the job.

There are two main questions when selecting the right magnet; how high do we want to levitate, and how much weight do we have to lift. The globe is around 1.25 pounds and with the extra lens and possible sensors we can round it up to 1.5 to 2 pounds that we need to levitate. Since the globe will be 12 inches in diameter lets go for ten percent levitation. By getting the RZ0X84 magnetic ring we will have 2.23 pounds 1.2 inches away from the magnet. In addition to using this ring we will have a smaller magnet on the bottom of the globe that will help repel the globe from the ground.

Another way we can levitate is by arranging a grid of square or cube magnets and placing the magnetic material on top. Not just a grid but also other arrangements like a tri-pod or a semi-sphere could be possible.

Sources:

<https://www.kjmagnetics.com/blog.asp?p=diamagnetic-levitation>

<https://www.kjmagnetics.com/calculator.repel.asp?calcType=ring>