PROJECT 3 FINAL PROPOSAL

Your last ModSim Project Proposal! This is the project idea you intend to pursue for the rest of the semester. If you are choosing to continue working on the idea you submitted in your preliminary proposal, please complete this template with an iteration of what you previously turned in: include any new information or refinements you have made to your question, model, results, and/or interpretation. You can also choose to pursue a different idea than you submitted for your preliminary proposal; use this template to lay out the QMRI for this new idea. ***Either way, complete the entire template***.

1 Question

What is the motivating question? Why would the answer matter, and who would care?

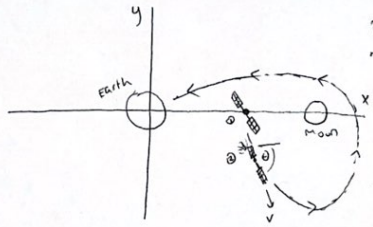
At what angle ~~and velocity~~ do I need to launch a spacecraft such that it slingshots around the moon ~~and returns~~ to same point... that point being the Lagrange point?

Given an emergency scenario where a spacecraft is heading to the moon is knocked off course (think Apollo 13), what is the minimum amount of course ~~trajectories~~ corrections (velocity, θ) it would take to slingshot the spaceship around the moon and back to Earth?

Important b/c space travel will increase in time and this is a very real situation that could occur.

2 Model

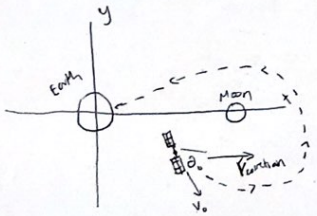
How will your model help you answer the question? What are the key elements of the model (e.g., State and System objects)? **Draw a schematic diagram (with objects, dimensions, forces, and axes).**



- F_g Earth
- F_g Moon
- Mass Earth
- Mass Moon
- Mass Satellite
- x, y, v_x, v_y of satellite
- ~~DELAUNAY~~
- Additional force vector to represent course correction

3 Results

What output do you expect the model to produce? Draw at least one graph — be sure to label the axes.



4 Interpretation

How do you expect the results to answer the question?

We expect to produce a singular force vector that can bring the spacecraft back on track or if possible, a list of optimized course corrections (minimized velocity change) to get the spacecraft back.

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