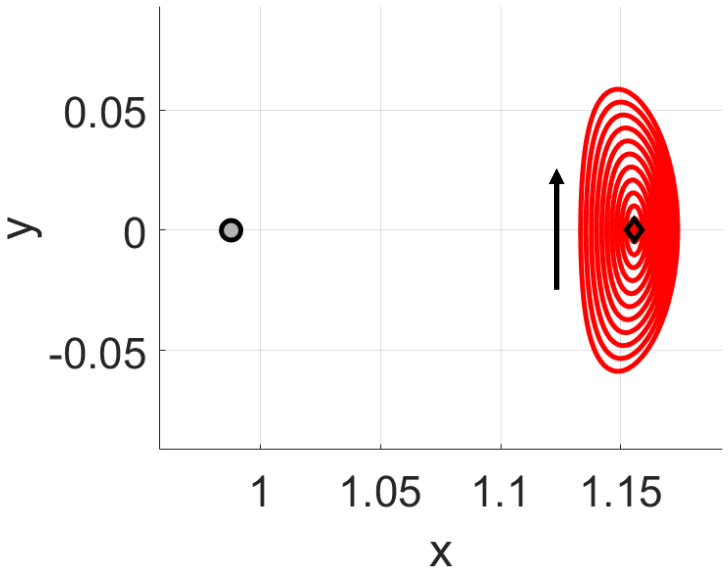
ASEN 6060
ADVANCED ASTRODYNAMICS
Week 7 Discussion, Part 2

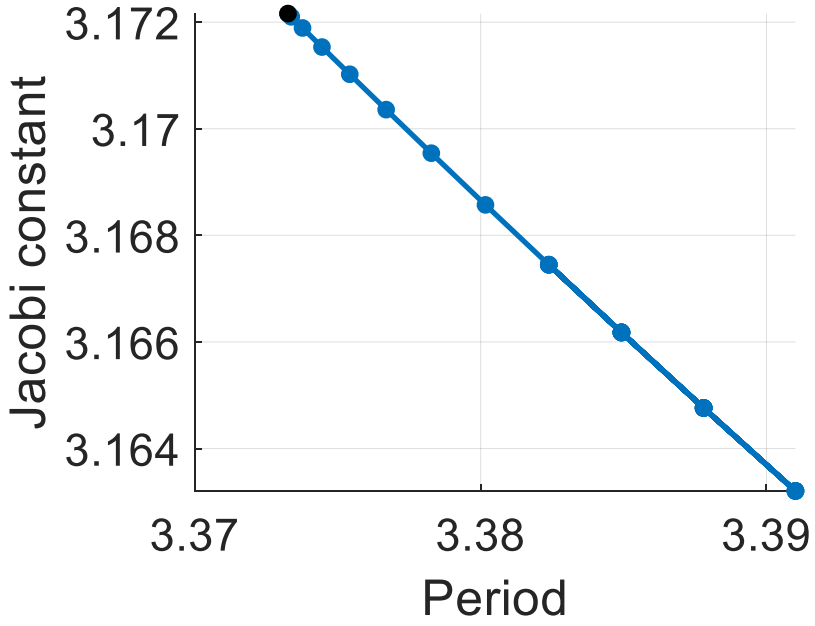
Objectives:

- Gain intuition that will be useful for creating, debugging and assessing implementation of continuation algorithms

Example 1: Computing L_2 Lyapunov Orbits

Your colleague is trying to compute orbits along the L_2 Lyapunov orbit family via pseudo-arclength continuation, but they cannot seem to calculate more members than those shown here.

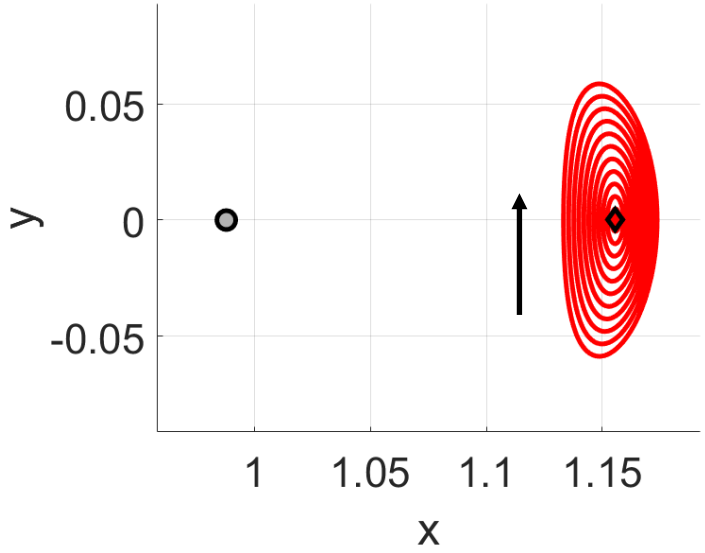


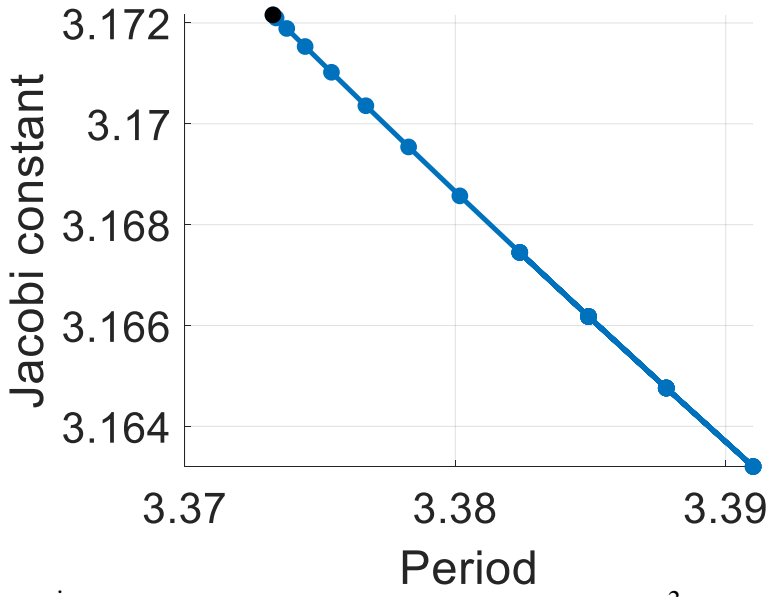


Question 1: What information would you ask for to explore the issue in their continuation scheme? Also create a list of ideas for what the problem could be.

Question 1

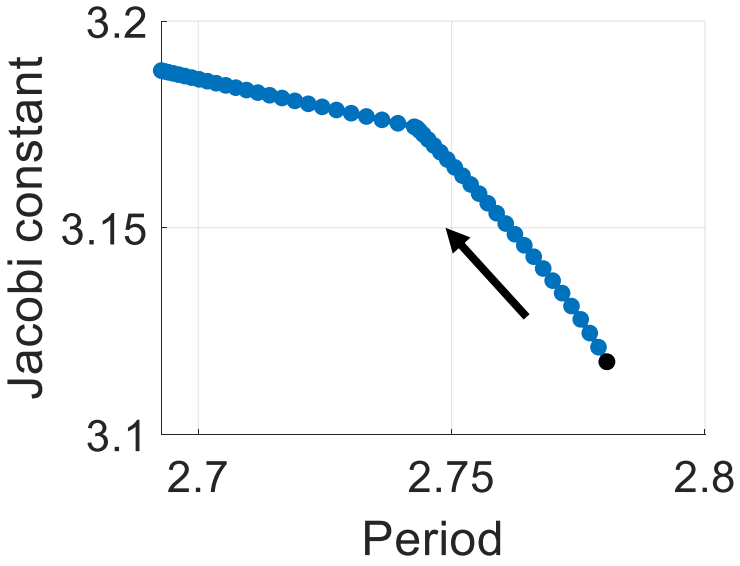
Group Brainstorming:

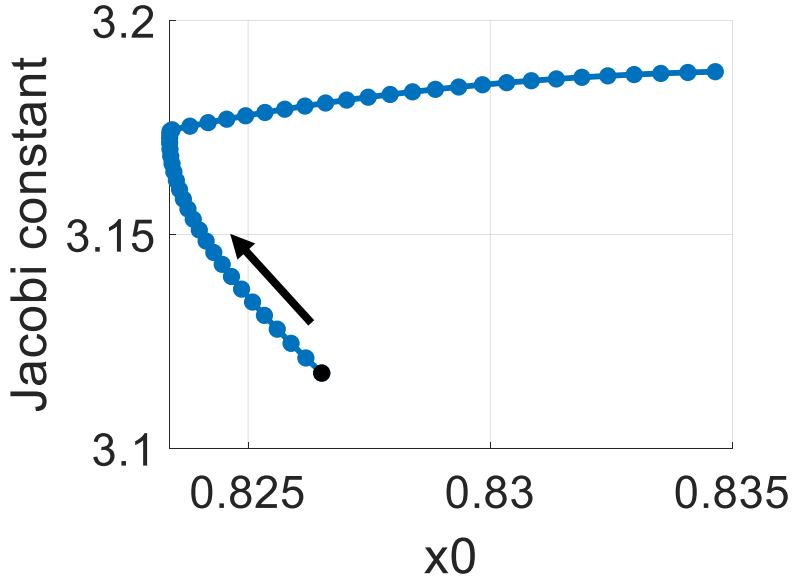




Example 2: Computing L_1 Halo Orbits

Your colleague is trying to compute orbits along the L_1 halo orbit family via pseudo-arclength continuation and they are analyzing the results by studying the characteristics of the computed orbits

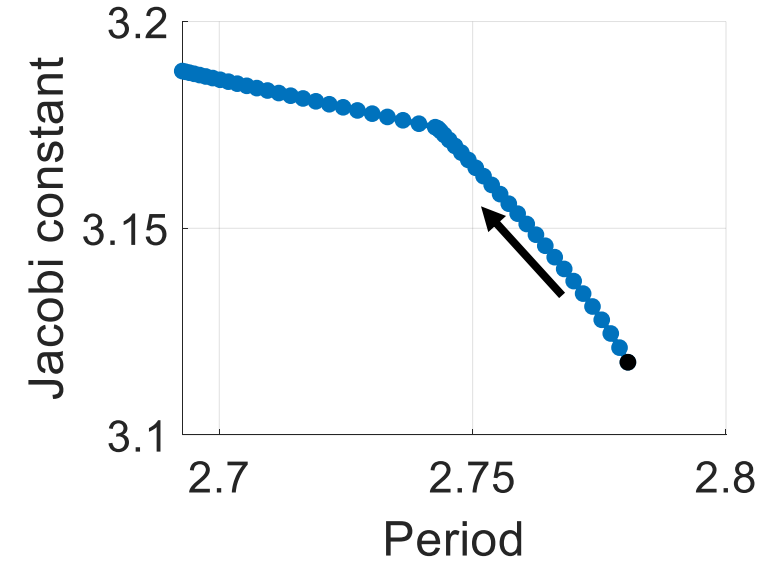


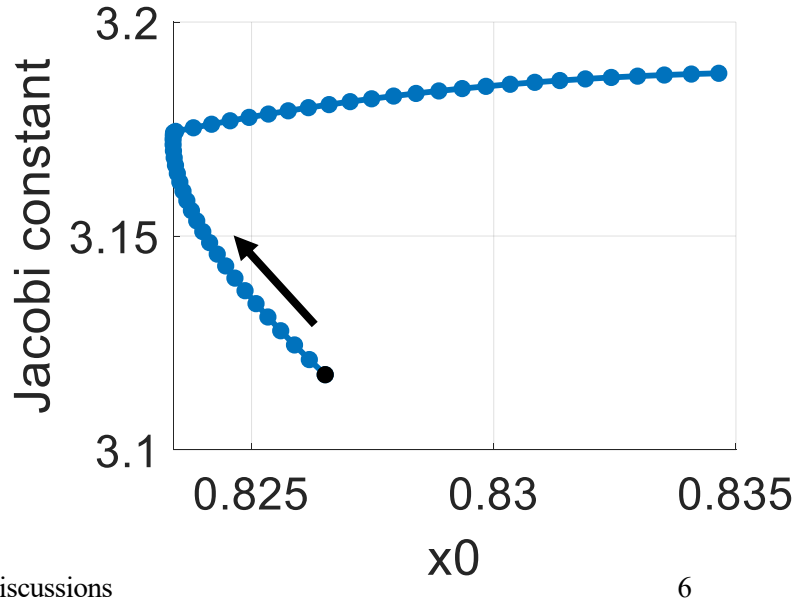


Question 2: Do you think their results indicate they have successfully computed the L_1 halo orbit family? Why or why not?

Question 2

Group Brainstorming:





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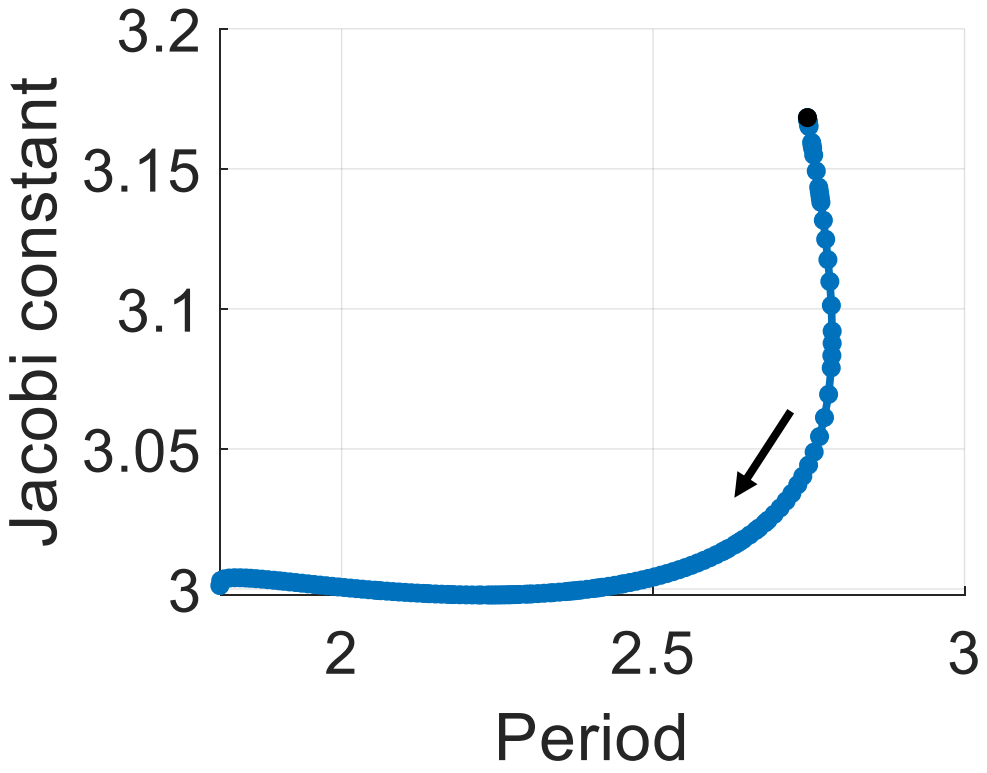

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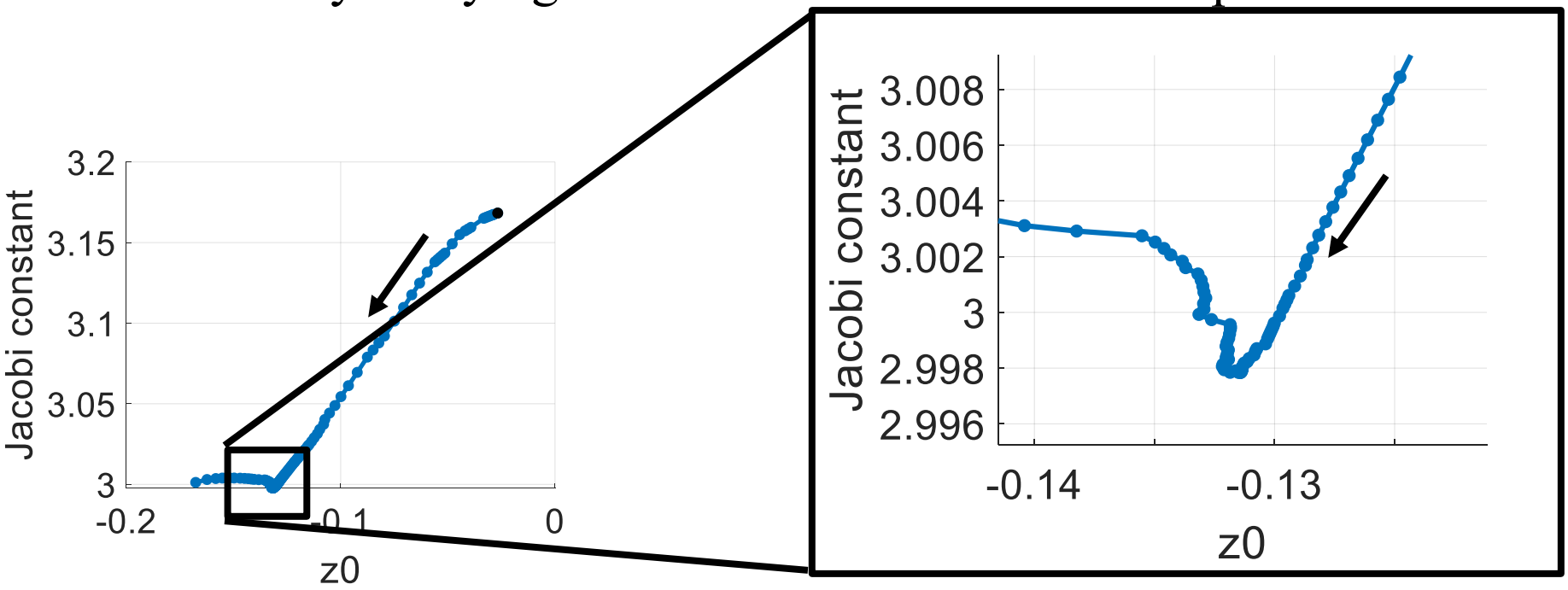
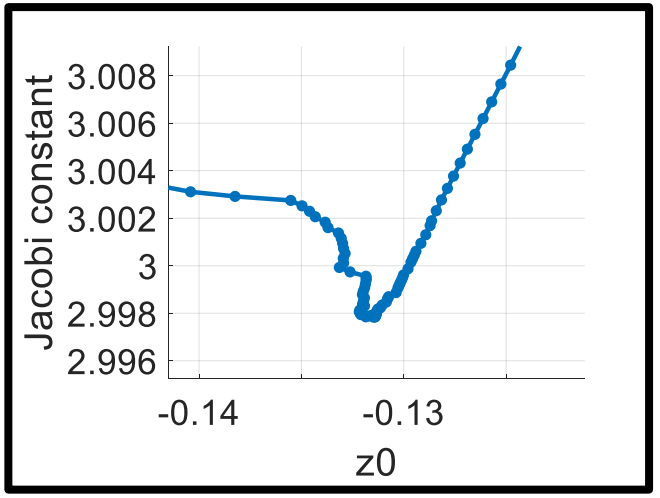
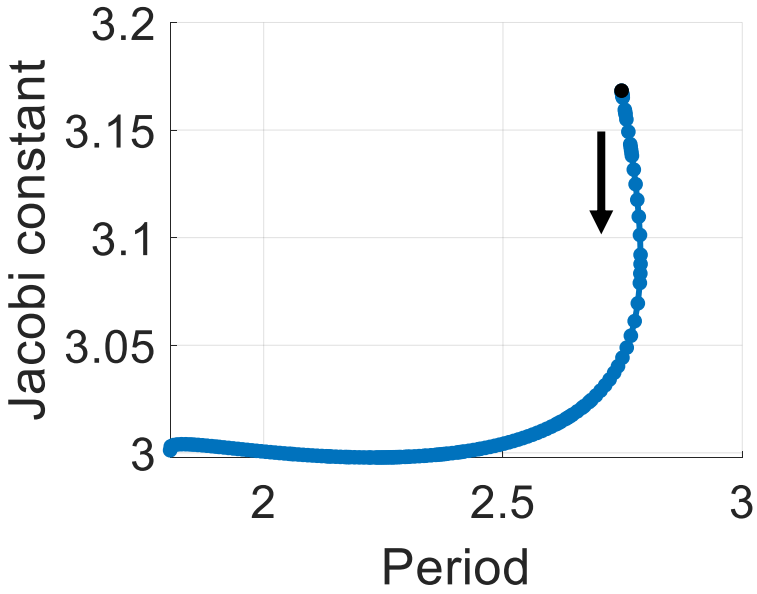


Question 3: Create a list of ideas for what could be causing the observed behavior and why.

Question 3

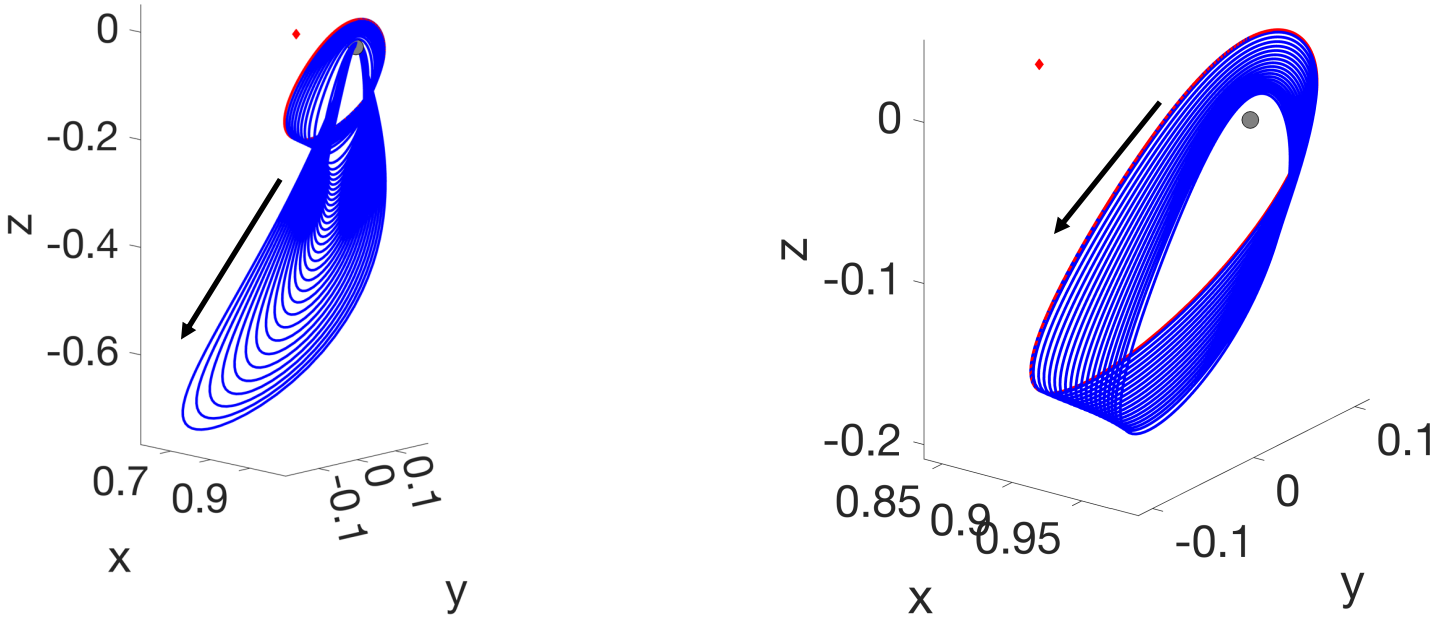
Group Brainstorming:





Example 4: Computing L_1 Halo Orbits

Two colleagues are trying to compute members of the L_1 halo orbit family that lie close to the Moon. They both used information about the same periodic orbit to form an initial guess for the first orbit and then applied pseudo-arclength continuation. But they recovered two distinct results:



Question 4: Create a list of ideas for what could be causing the differences and why.

Question 4

Group Brainstorming: