OPTIMAL TITAN TRAJECTORY DESIGN

Problem Statement and Approach

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Problem Statement

- Problem:
  - Design a trajectory to Titan using Invariant Manifolds and Gravity Assists
    - Reoptimize initial guess trajectory using Discrete Mechanics and Optimal Control (DMOC)
    - Compare objective function: ΔV vs. (ΔV and TOF)

- Background: Have initial guess trajectory optimized through multiple shooting

Strategic Overview

1. Reproduce Trajectory Initial Guess (~ 3 weeks)
   a) Invariant Manifolds
   b) Resonant Gravity Assists
   c) Patch trajectories
2. DMOC Optimization
   a) Define functions and constraints
   b) Define numerical method parameters (Timestep, Nodes)
   c) Optimize trajectory (ΔV vs. (ΔV and TOF))