HASKELL SPACEFLIGHT WORKSHOP

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Introduction

In this workshop, we take an enthusiastic numerical approach to simulating spacecraft maneuvers. Our workshop examples appear in the published literature, yet we must begin by stating that there are often more elegant solutions to the problems we describe, allowing results to be found more economically and precisely. For these solutions, we must refer readers to a comprehensive textbook on astrodynamics (eg. [1]). We have chosen to take our somewhat simplified numerical approach for the following reasons:

1. It makes a 90 minute workshop possible, where an exploration of tailored methods would require weeks of work,
2. It allows us to frame several problems as initial value problems of ODE integration,
3. It introduces techniques that are widely applicable to dynamical systems outside of spaceflight, and
4. We believe it provides a good introduction, motivating more sophisticated approaches quite naturally as individuals explore further.

References

[1] Richard H. Battin. *An introduction to the Mathematics and Methods of Astrodynamics, Revised Edition*. American Institute of Aeronautics and Astronautics, 1999.