Research project meeting summary: Trajectory Module for Launcher MDAO

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Review of previous work

Literature review:

Finished the summaries of the bibliography shared by Dr. Balesdent covering mainly optimal control and integration with MDAO. This last part is still not very clear for me, I found a paper that may clarify this "Optimal Control within the Context of Multidisciplinary Design, Analysis, and Optimization".

I found new papers covering mainly control sequences for launcher ascent, I have only one covering boost-back maneuver and landing sequence.

I have to look for 3D cartesian coordinates examples, so far I have only seen spherical and some strategies to treat the singularities.

I will share with you the Literature Review Sketch I have been doing.

To do next: More on MDAO and integration with optimal control. More on RLV.

Derivation of EoM:

2D rotating frame, I am solving the equations with SYMPY (Symbolic math library). Discuss relevance.

First report:

Structure according to "Report guideline":

- only 2 to 5 pages?
- Main goal
- Literature review
- Plan (Milestones, tasks, possible issues)
- Derivation of EoM?

Question: Can I take the MDAO course?

Presentation of LAST on March 18th, 13:30h at 61-106

I met Guillaume who's going to be working on LAST as an intern

- **Bibliography :** Write down the literature review for Semester 2 progress report. I will do it based on the literature review sketch I've already done.
- **Coding the Optimization:** (the same as last meeting as I focused more on the Literature review part) For the 2D EoM write direct method (NLP) with single and multiple shooting using analytic derivatives. For simplicity, I can start outside of OpenMDAO