# Research project meeting summary: Trajectory Module for Launcher MDAO

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# Plan:

1. Review of previous work
2. Key points discussed
3. Future actions

# Review of previous work

S2 Progress Report: I have not finished yet. 80% progress

contents:

1. Introduction
2. aim
3. objectives
4. Literature review: EoM, Forces, Control laws, Optimal control and MDAO
5. Plan and description of tasks

# Key points discussed

Shooting method: Two point Boundary Value problem with initial and final conditions.

1. Propagate numerically the states from initial guess
2. Calculate error
3. Input error and analytic derivatives into NLP solver

# Key points discussed

Integration of Optimal control and Open MDAO is possible in two ways:

- Trajectory optimization as a discipline (The one we are going to be focused on)
- Trajectory simulation but optimization is performed by the global optimizer of OpenMDAO

Order of events in Dymos must be predetermined, how can we use it in such a way that events can alternate order to provide optimal solution?
Example of Fairing and stage separation
We can look at the numerical methods used in Dymos to propagate equations.

# Future actions

- Finish S2 progress report
- Identify the Runge method used in dymos to propagate the solution of EoM in the shooting methods.