# GMAT Low-Thrust Folder

## GMAT download:

<https://sourceforge.net/projects/gmat/>

Compiling process:

<https://gmat.atlassian.net/wiki/spaces/GW/pages/380273355/Compiling+GMAT+CMake+Build+System>

<https://github.com/ChristopherRabotin/GMAT>

## Contents of Folder:

This folder contains files that you might find useful for GMAT Low-Thrust Trajectory optimization.

**GMAT\_LowThrust\_Function** contains a Matlab function capable of propagating and optimizing low thrust trajectories in GMAT. Refer to the readme file in that folder for more information.

**Archived Work** contains files that are previous attempts at optimizing trajectories and files used to prototype the method used in GMAT\_LowThrust\_Function. These files might be useful.

**SNOPT Folder** contains the proprietary Optimization algorithm that is used for Trajectory optimization. SNOPT is required for optimizing trajectories in GMAT\_LowThrust\_Function and GMAT’s CSALT plugin.

**CSALT\_ Compilation** contains files documenting how to compile GMAT’s CSALT plugin. The work in this file is incomplete. It only documents up to step 3 in the compiling process.

**Reports** contain documentation on the work that was done for this project.

## Suggestions:

Although GMAT\_LowThrust Matlab function works, the run time can be very long. Personally (from the perspective of the person who worked on this project last) I don’t see any way the run time can be further reduced. The best approach would be to continue working on completing the compilation of the CSALT plugin to acquire a low-thrust optimization tool that would work in GMAT. The GMAT\_LowThrust function can still be used in the meantime to validate problems.

Once CSALT compilation is completed it might be advantageous to develop a way to automatically set up and optimize low thrust trajectories through API commands similar to what is done in GMAT\_LowThrust.

Because EMTG objects can be used in CSALT a tool-chain between the two software can be developed to automatically run initial guesses through EMTG then through CSALT in GMAT.