**MEE Picard-Chebyshev for Propagating**

**Perturbed Two-Body Orbits**

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**Compile & Run**

1. Compile the matrix builder from within /src

***>> make matrix\_builder***

1. Perform the one time build of the constant Picard-Chebyshev matrices from within /src

***>> ./matrix\_builder***

1. Compile the propagator from within /src

***>> make***

1. Propagate the test case orbit from within /src

***>> ./test\_mee***

**Functions**

**\src**

**c\_functions.c**

Performs some simple vector-matrix operations.

**chebyshev.c**

Generates Chebyshev polynomials of the first kind.

**clenshaw\_curtis\_I.c**

Generates constant matrices for first order Clenshaw-Curtis Quadrature.

**ecef2eci.c**

Converts states from the body frame to the inertial frame.

**eci2ecef.c**

Converts states from the inertial frame to the body frame.

**EGM2008.c**

Computes the spherical harmonic gravity for a specified degree and order.

**lsq\_chebyshev\_fit.c**

Builds least squares operator and Chebyshev matrix.

**makefile**

File to compile all the code.

**matrix\_builder.c**

One time build & store constant matrices required for the Adaptive Picard-Chebyshev numerical integration method.

**matrix\_loader.c**

Loads constant matrices required for the Adaptive Picard-Chebyshev numerical integration method.

**rv2elm.c**

Converts Cartesian to Keplerian orbit elements.

**test.c**

Sets up a test case and runs ***adaptive\_picard\_chebyshev***.

**\inc**

This folder contains all the header files corresponding to the .c sourse files in the \src folder. In addition, const.h is also located in this folder. Const.h specifies a number of astrodynamics constants.

**\matrices**

This folder stores the Picard-Chebyshev matrix binary files after the matrix\_builder command is run.