MEE Picard-Chebyshev for Propagating Perturbed Two-Body Orbits

Robyn Woollands

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Compile & Run

1. Compile the matrix builder from within /src
   >> make matrix_builder
2. Perform the one time build of the constant Picard-Chebyshev matrices from within /src
   >> ./matrix_builder
3. Compile the propagator from within /src
   >> make
4. 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.