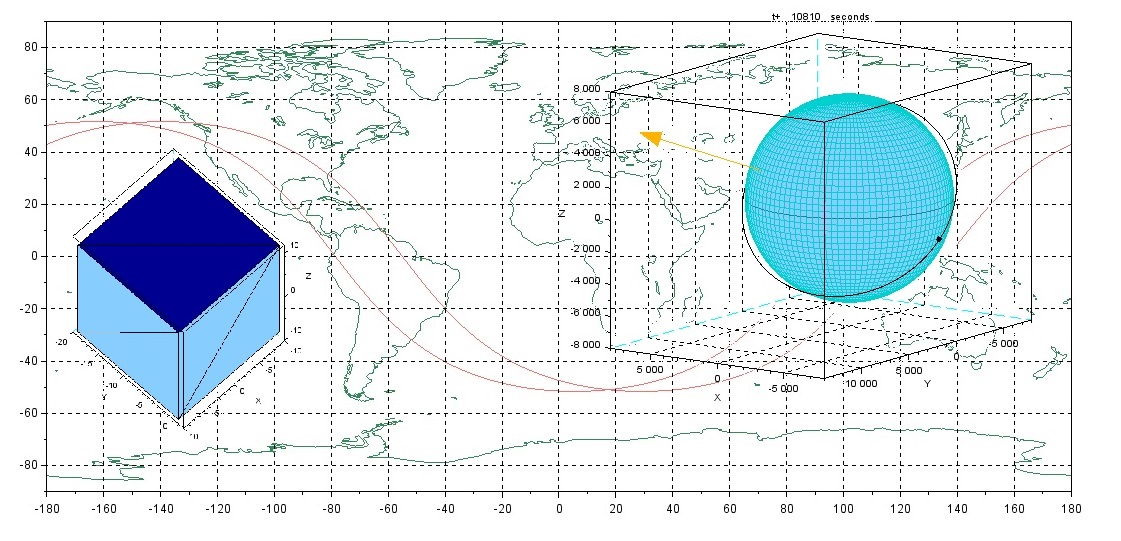
**Earth Orbiter System**



**User Manual**

**V. 0.4.0**

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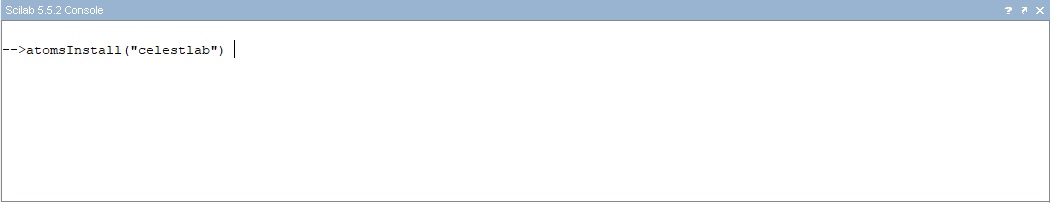
**Installation**

1: Install Scilab version 5.5.2

* Go to: <https://www.scilab.org/en/download/Previous-Scilab-Versions>
* scroll down the page towards the bottom, download version 5.5.2 (appropriate for your system)
* Run the installer, follow steps to install Scilab

2: CelestLab toolbox

* Enter the following into Scilab Console: atomsInstall("celestlab")



(Alternatively, download toolbox binary from: <https://atoms.scilab.org/toolboxes/celestlab> and install manually.)

3: STL toolbox

* Go to: <https://fileexchange.scilab.org/toolboxes/490000>
* Download “stlfiles.zip”, extract to Scilab work directory
* Using Scilab, run “builder.sce” script in the sources folder
* Run “loader.sce” script in the sources folder

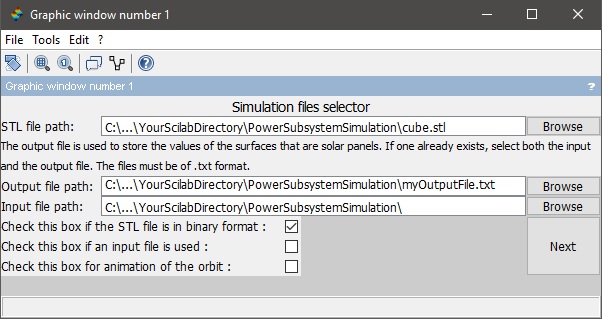
4: EarthOrbiterSystem

* <https://github.com/Matthieu-71/PowerSubsystemSimulation>
* Unzip to Scilab work directory

**Operation**

Run “main.sce”

*Using an input file: this will remember the solar panel surfaces selected from a previous sim.* *(Useful for re-simulating complicated models)*

**

1: Select STL file

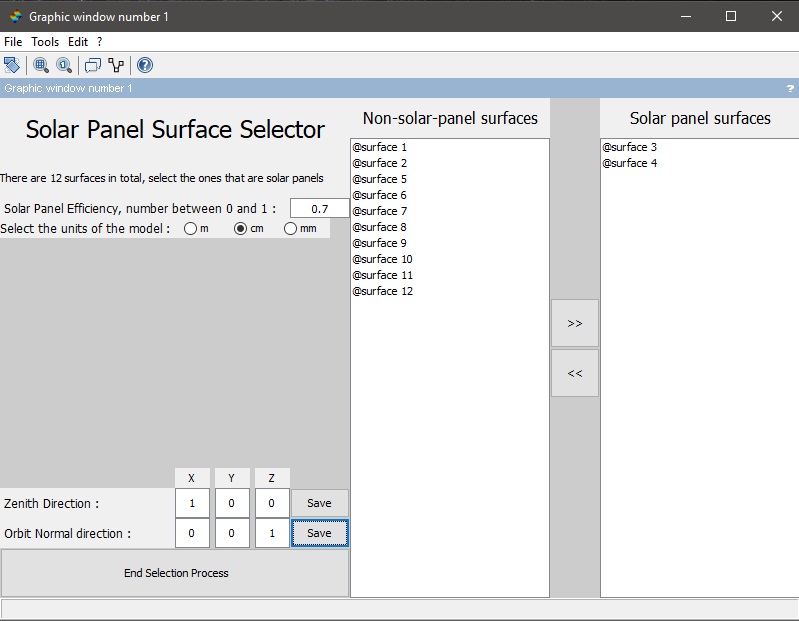
2: Select Output File (must be .txt extension

Optional: Select Input File (must be .txt extension)

4: Click “Next”

3. Check the binary box if applicable (cube.stl is a binary)

Optional: 3D animation of satellite orbit



1: Input the Solar Panel efficiency, must be a number between 0 and 1

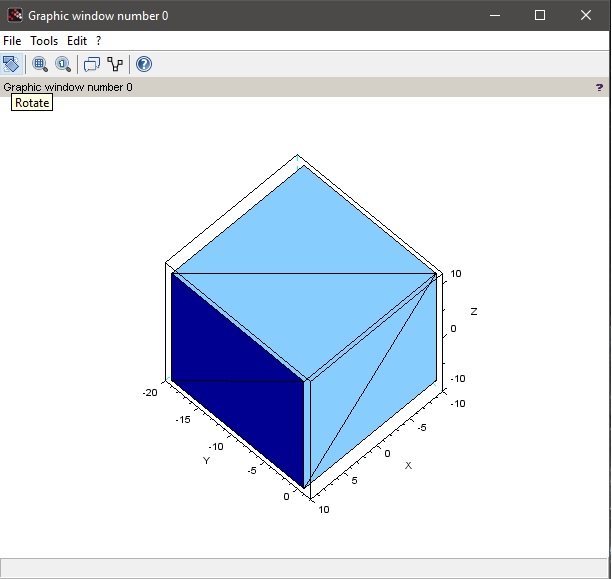
2: Select the dimensions of the stl model

4: Using the model axes for reference, input the zenith and orbit normal direction for the body frame.

3: Select desired surface and use the “>>” button to make them act as solar panels. Panel surfaces will appear as dark blue on the model.

5: Make sure you “save” these vectors before continuing.

6: Click “End Selection Process”

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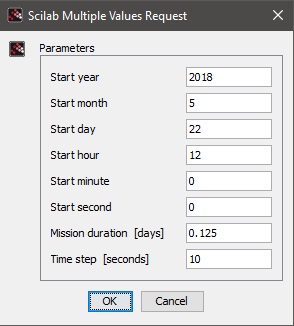
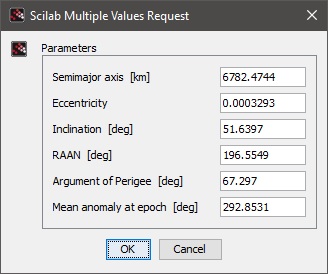
Model window displays the .stl file. Surfaces in dark blue indicate the user-designated solar panels.

Model can be rotated with right-click to view hidden surfaces.

3: Input desired Mission time and duration

1: Input desired Orbital Parameters

(default is set to ISS orbit)



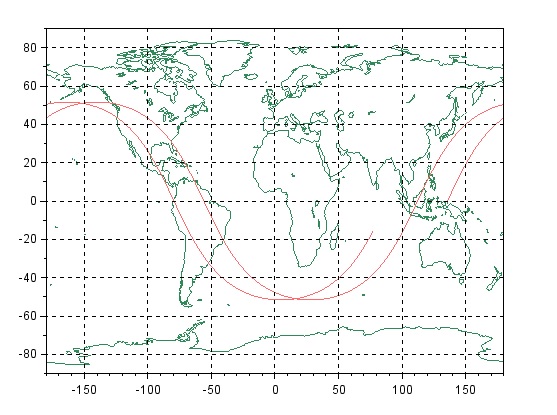
(Timestep is recommended to be between 10 and 30 seconds)

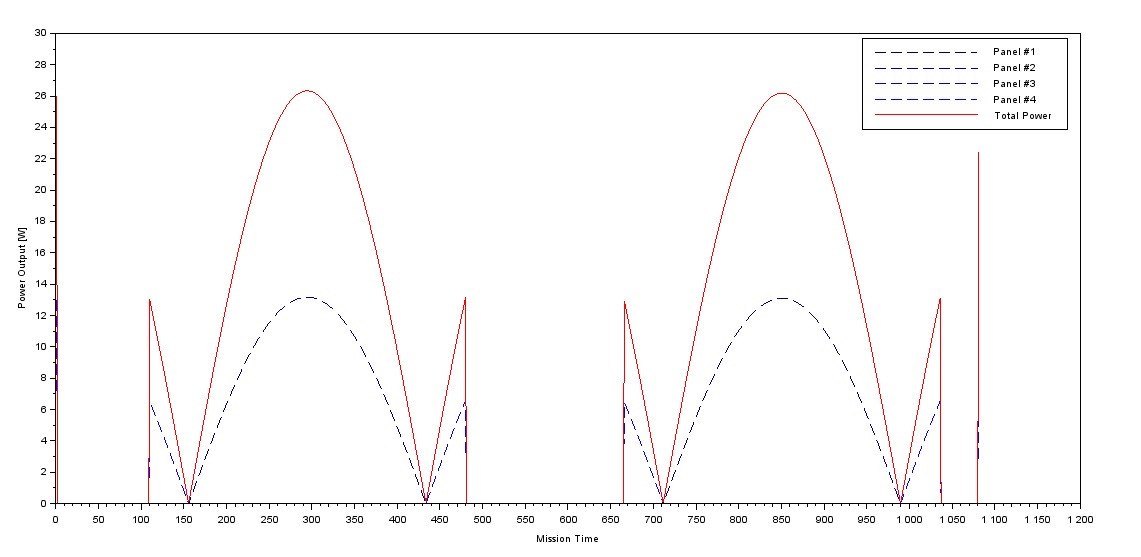
4: Click “OK”

2: Click “OK”

**Simulation Output**

1. Ground Track



b) Solar Panel Power Produced

*The dashed blue lines indicates power produced at each time step by the solar panel faces. The panel numbers correspond to the order of selection in the surface-selector gui. Note that for faces with similar orientation, the plots may exactly overlap (e.g Panels 1-2 and 3-4 appear as only two plots in the above image).*

c) Space Environment Orbit Animation