

Systems Module

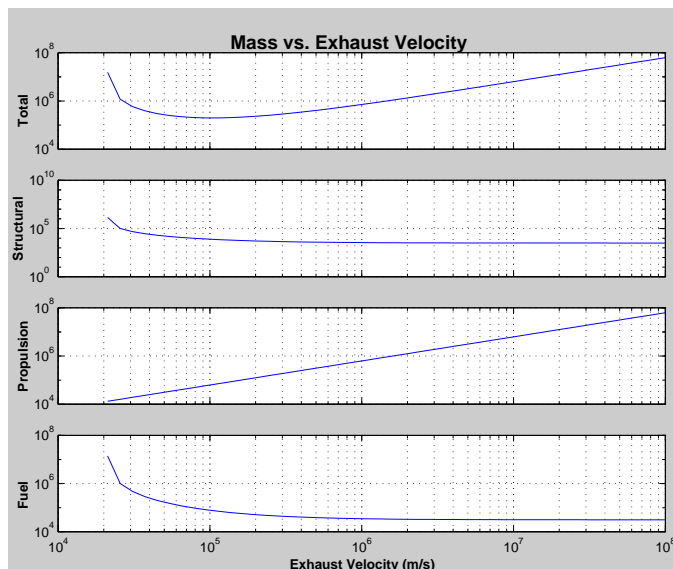
The “Systems Modules ” are modules with the Spacecraft Control Toolbox which enable subsystem analysis as relevant to attitude control system design.

Propulsion System Module

The propulsion module provides models for electric and chemical propulsion systems. Features include

- Electric propulsion system optimization
- Multistage rocket analysis
- Solid rocket dynamics model
- Blowdown propulsion system design tools
- Plume analysis
- Nuclear thermal propulsion analysis
- Launch vehicle analysis
- Plasma propulsion functions

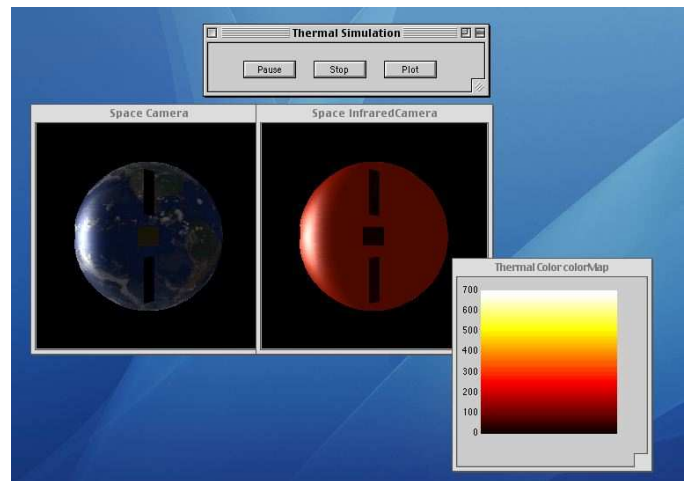
The following figure shows the results of designing an electric propulsion system with a power system which has a power to mass ratio of 20 kW/kg, which may be possible with advanced fusion propulsion concepts.



Thermal System Module

The thermal module provides thermal design functions.

- Thermal properties
- Thermal radiation analysis
- Thermal dynamics simulation
- Thermal network analysis
- Thermal equilibrium calculations including radiation and conductive heat transfer using the powerful MATLAB sparse matrix functions



Link System Module

The link module provides radio frequency and optical link calculations.

- Link budgets for spacecraft to spacecraft and spacecraft to ground communication
- Noise models including receivers, rain, sky, sun and moon
- Optical background noise
- Radar analysis

Compatibility

The toolbox is compatible with MATLAB version 7, Windows XP/NT/2000, UNIX, and MacOS.