

MBSE

Solution for
NASA and INCOSE

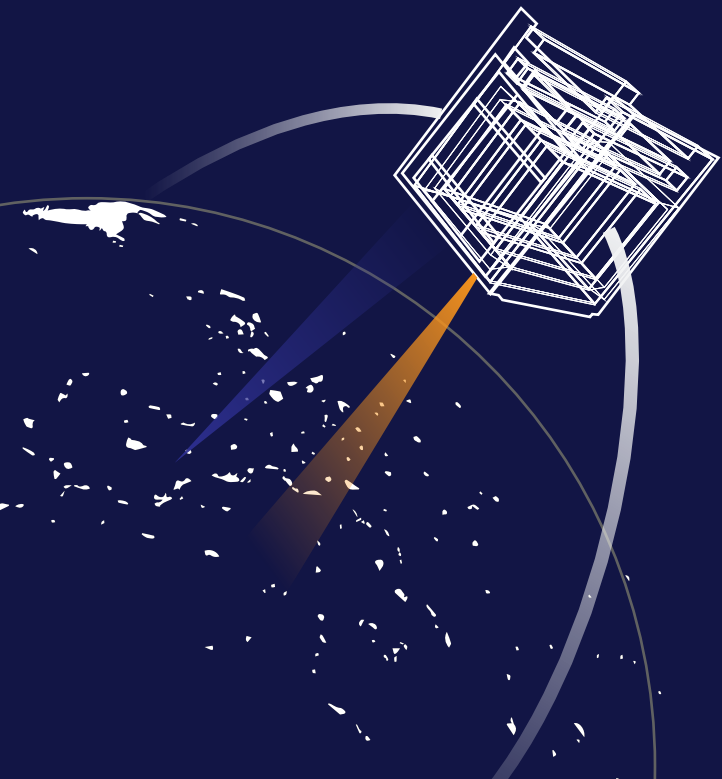
Modeling & Simulation of CubeSat Mission

CubeSats are a class of research spacecraft called nano satellites.

The cube-shaped satellites are approximately :

- 10 cm long,
- have a volume of about 946 cm³
- weigh about 1,4 kg.

CubeSats are flown as auxiliary payloads on previously planned missions.



Challenges

- How do satellite states evolve throughout mission?
- Does the vehicle design/operations meet all mission requirements?
- How do changes in spacecraft mission parameters impact performance and requirements satisfaction?

Results

- Developed fundamental systems model of CubeSat mission
- Coupled analytic models with simulation capabilities
- Mission and Design Trade-Offs
- Achieved requirements verification for full end-to-end missions

Solutions

- **MBSE**
- **MBSE Tools:**
 - **Modeling:** MagicDraw + SysML,
 - **Simulation:** Cameo Simulation Toolkit,
 - **Integration:** Phoenix Model Center,
 - **Analytical Models:** STK, and Matlab

Integrated models and tools are critical to design and plan for these missions!

