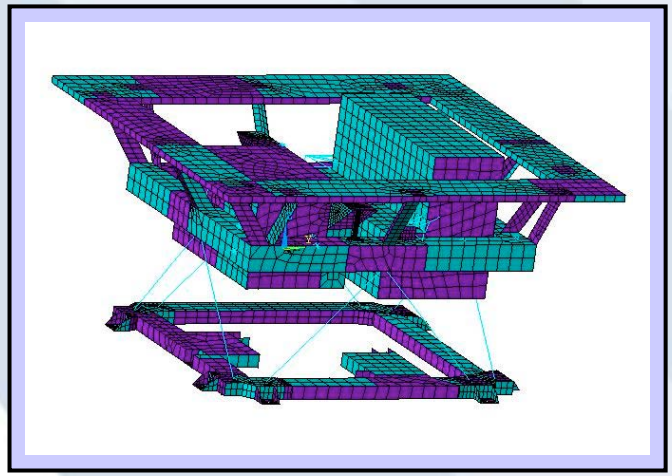
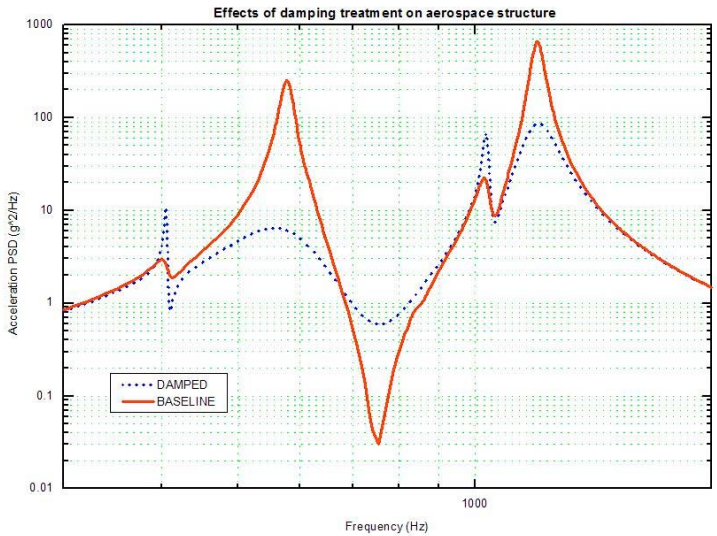
Vibration reduction of spacecraft during launch

- Problem description: Very delicate optical imaging system had to be deployed in space. High vibration loads during launch may cause instrument to be damaged

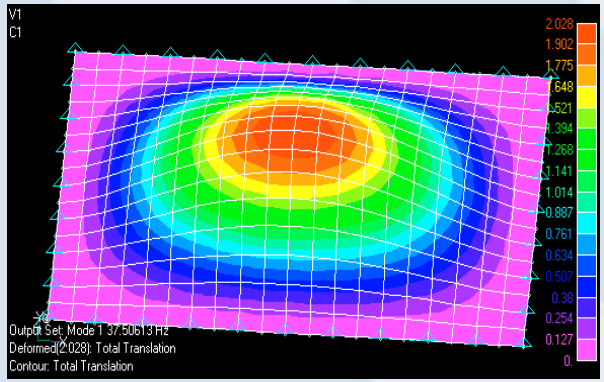


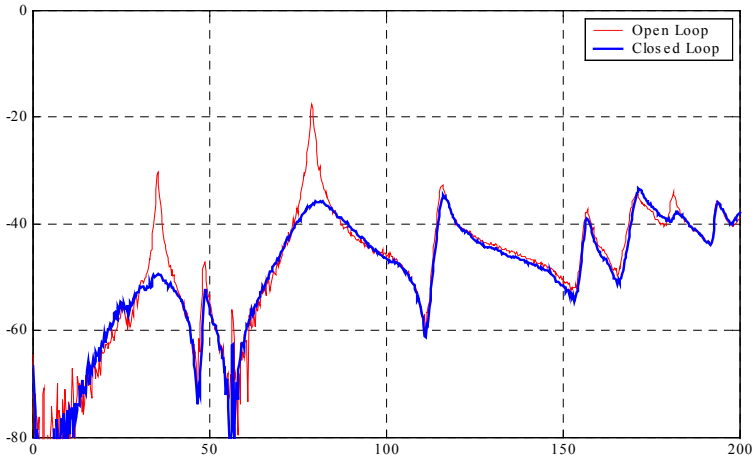


- Technology used: Viscoeleastic damping treatments and tuned mass damper system
- Technical results: 15dB broadband vibration reduction

Active vibration control of satelite solar panel-like structure

- **Problem description: satellite have large lightweight panels that need to be accurately controlled**



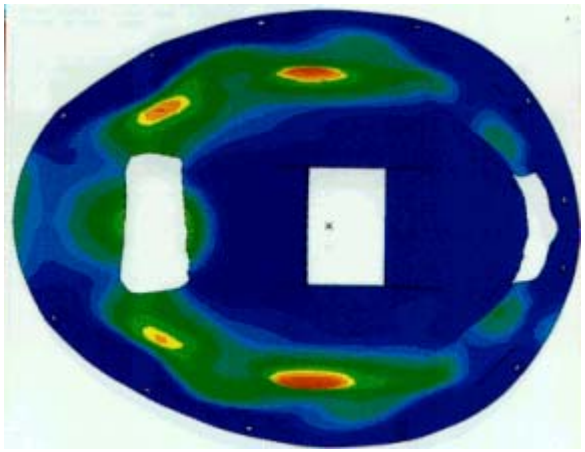


- **Technology used: Active vibration control, 1 sensor, single mode LQG controller, 2 piezoelectric actuator**

- **Technical results: 20dB reduction of the first two plate modes using actuators and sensors weighing a total of 50 grams**

Design optimization of composite material dome

- **Problem description: weight had to be reduced to save money. Dome had to withstand aerodynamic loads and structural loads during flight**



- **Technology used: Numerical optimization and carbon fiber layup with honeycomb core**
- **Technical results: 60% weight reduction of part for same aerodynamic loading capability**