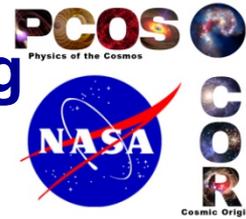


Reflection Grating Modules: Alignment and Testing

PI: Randall McEntaffer/University of Iowa



Objectives and Key Challenges:

- To increase the TRL of off-plane gratings
- Align multiple gratings into flight-like modules
- Performance test aligned gratings for spectral resolving power
- Environmental test modules with performance verification

Significance of Work:

- Enables future spectrometers to accomplish key soft X-ray science goals that require high sensitivity combined with high spectral resolving power

Approach:

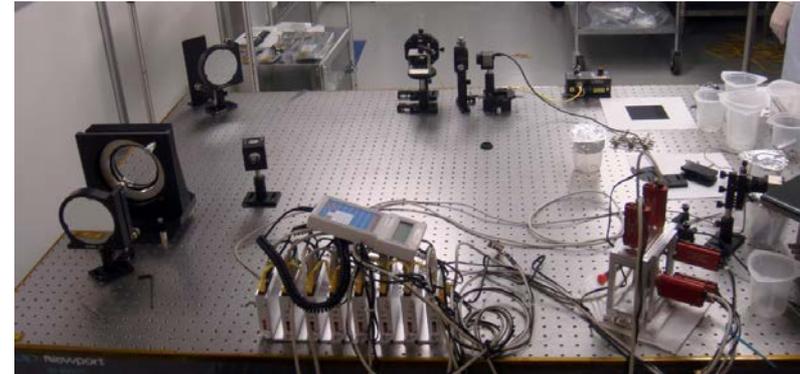
- Leverage from previous SAT and supporting programs to supply gratings and preliminary designs
- Align gratings into module using proven methods
- Use Stray Light Facility at MSFC for performance and environmental testing

Key Collaborators:

- Jessica Gaskin, MSFC
- Will Zhang, GSFC

Current Funded Period of Performance:

- 01/2015 – 12/2016



Upper left: Metrology system for grating alignment,
Lower right: Grating module with pico actuators

Recent Accomplishments:

- ✓ Initial testing of prototype gratings has been accomplished
- ✓ Alignment tolerances are known
- ✓ Initial modules have been fabricated and tested

Next Milestones:

- Test active and passive module mounts (Year 1)
- Increase fidelity of module mount and alignment methodology (Year 1 – Year 2)
- Test flight-like aligned module (Year 2)

Application:

- Suborbital rocket missions - OGRE
- Small Explorers - Arcus

$TRL_{In} = 3$ $TRL_{PI-Asserted} = 4$ $TRL_{Target} = 6$