AMTD-II Test Plan Status

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Mirror Tech Days

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AMTD-2 1/3 scale of 4-meters mirror

vendor/material	ROC (m)	dia. (m)	R/#
Harris/Corning ULE	3.5	1.5	R/2.3
Schott Zerodur	3.2	1.2	R/2.67

Schott Extreme lightweight Zerodur mirror (ELZM)

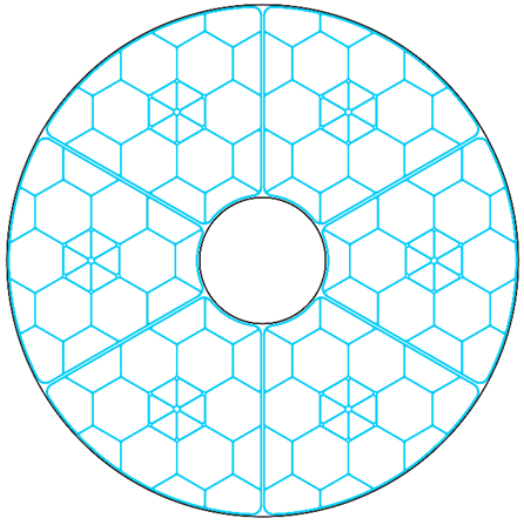
Test facility modification for AMTD-2

Provide a common test facility and instruments to characterize different mirror architectures.

Measure optical figure at 293º to 253º K (20º to -20º C) to validate thermal model.

Perform modal test to validate model.

Test readiness in 2016.



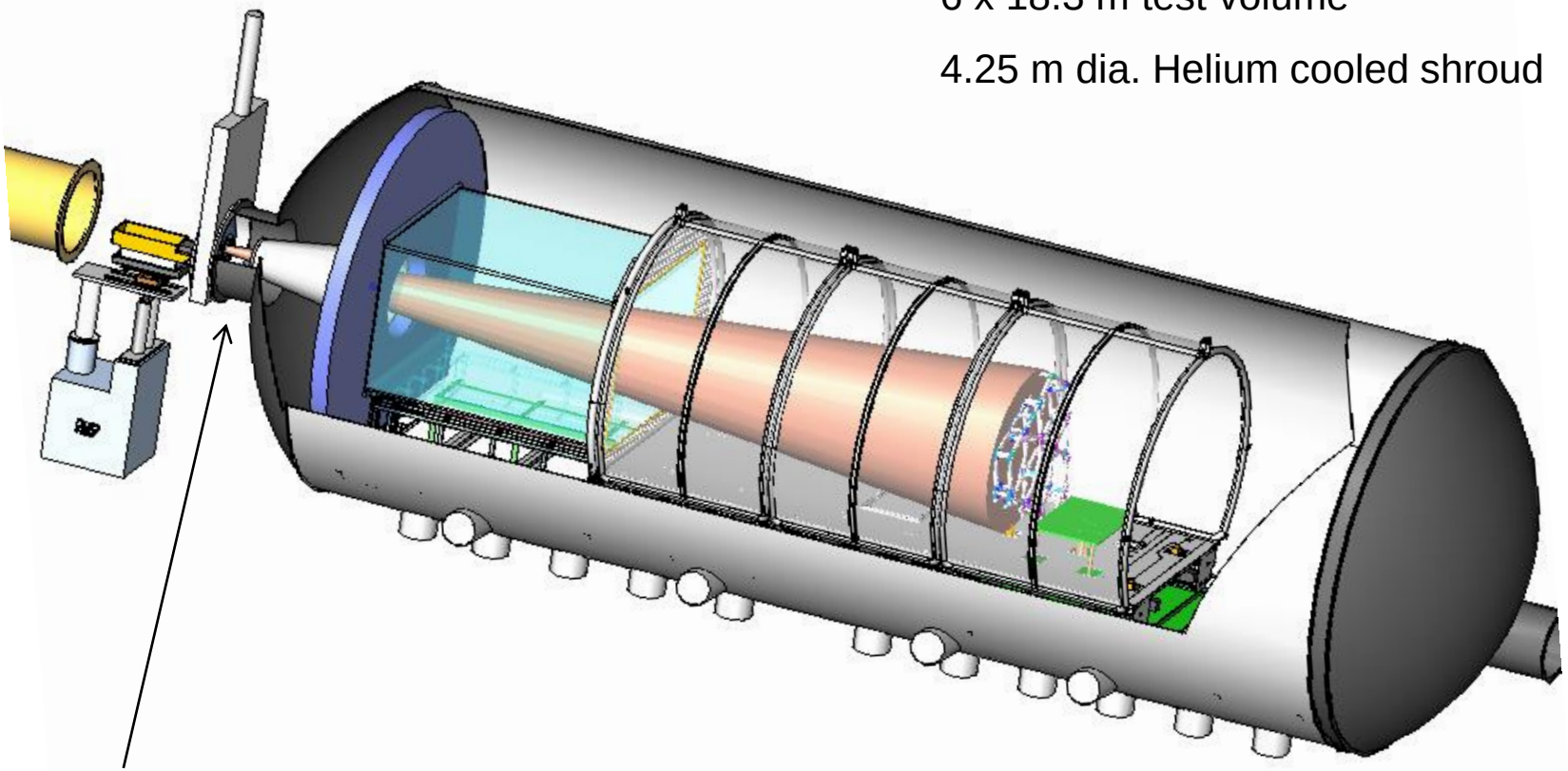
Corning ULE mirror (Harris Corp)

JWST PMSA test configuration at XRCF

16 m ROC; ~4 m dia.

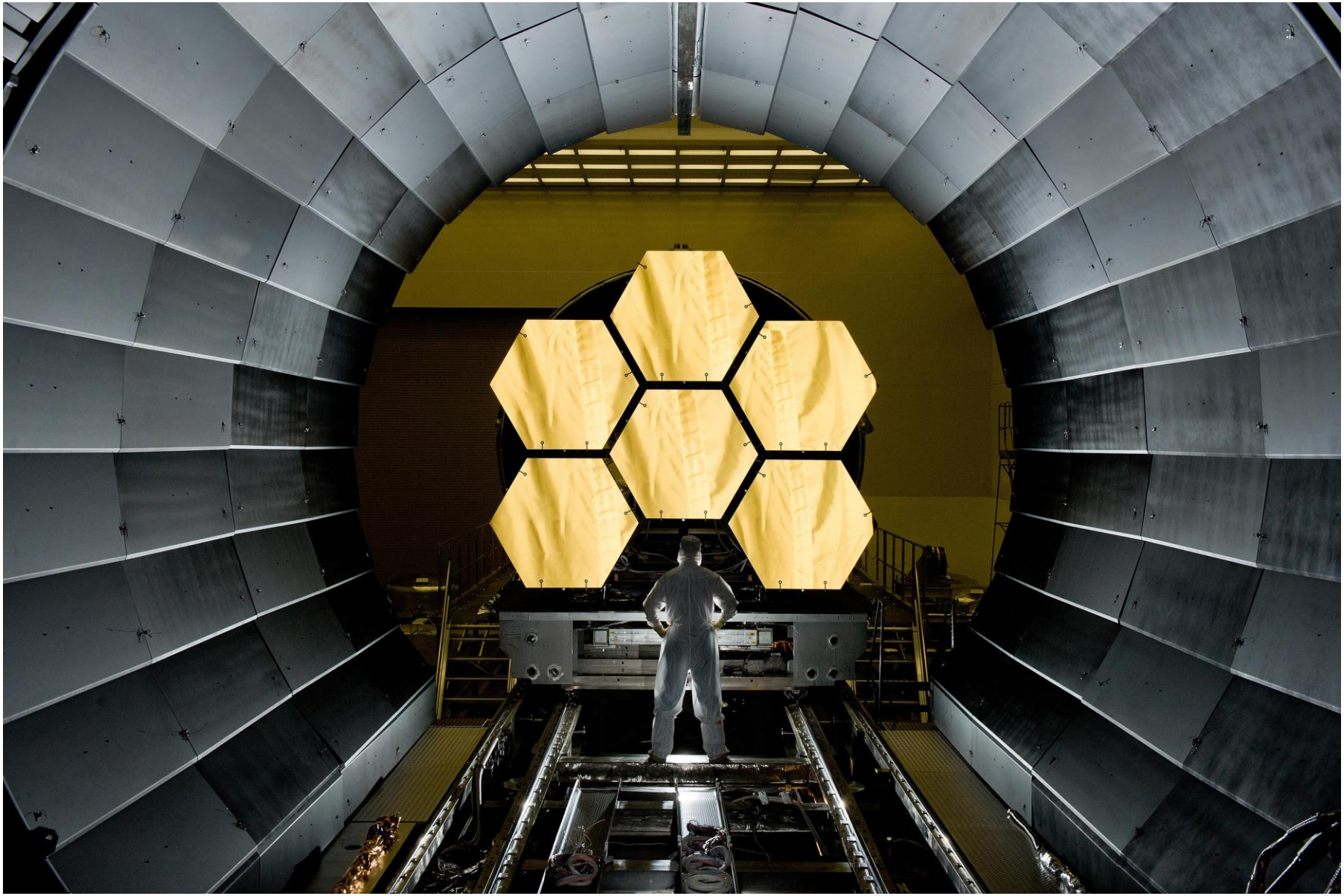
6 x 18.3 m test volume

4.25 m dia. Helium cooled shroud

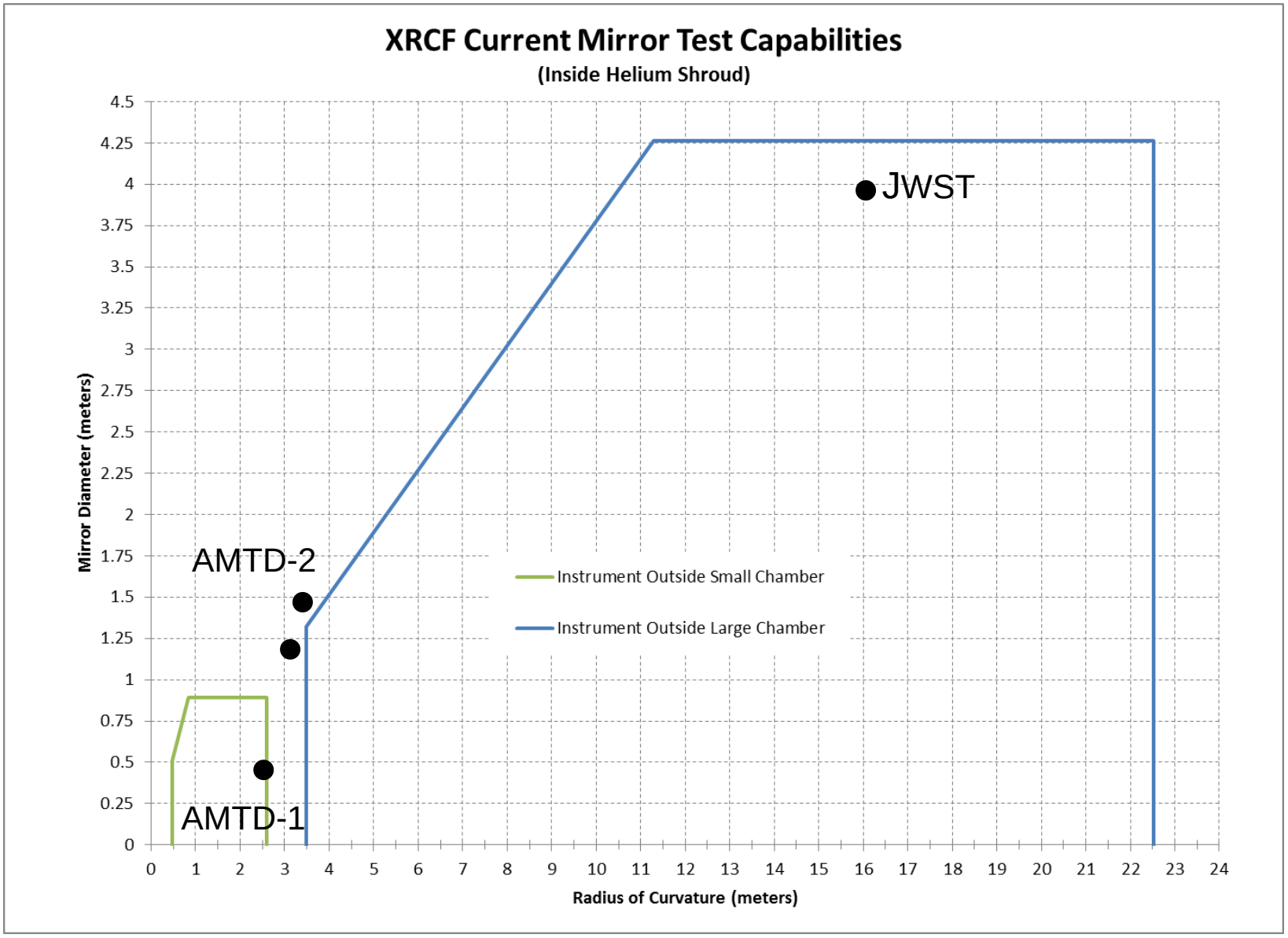


Existing structures won't allow testing mirror with ROC < 3.5 m.

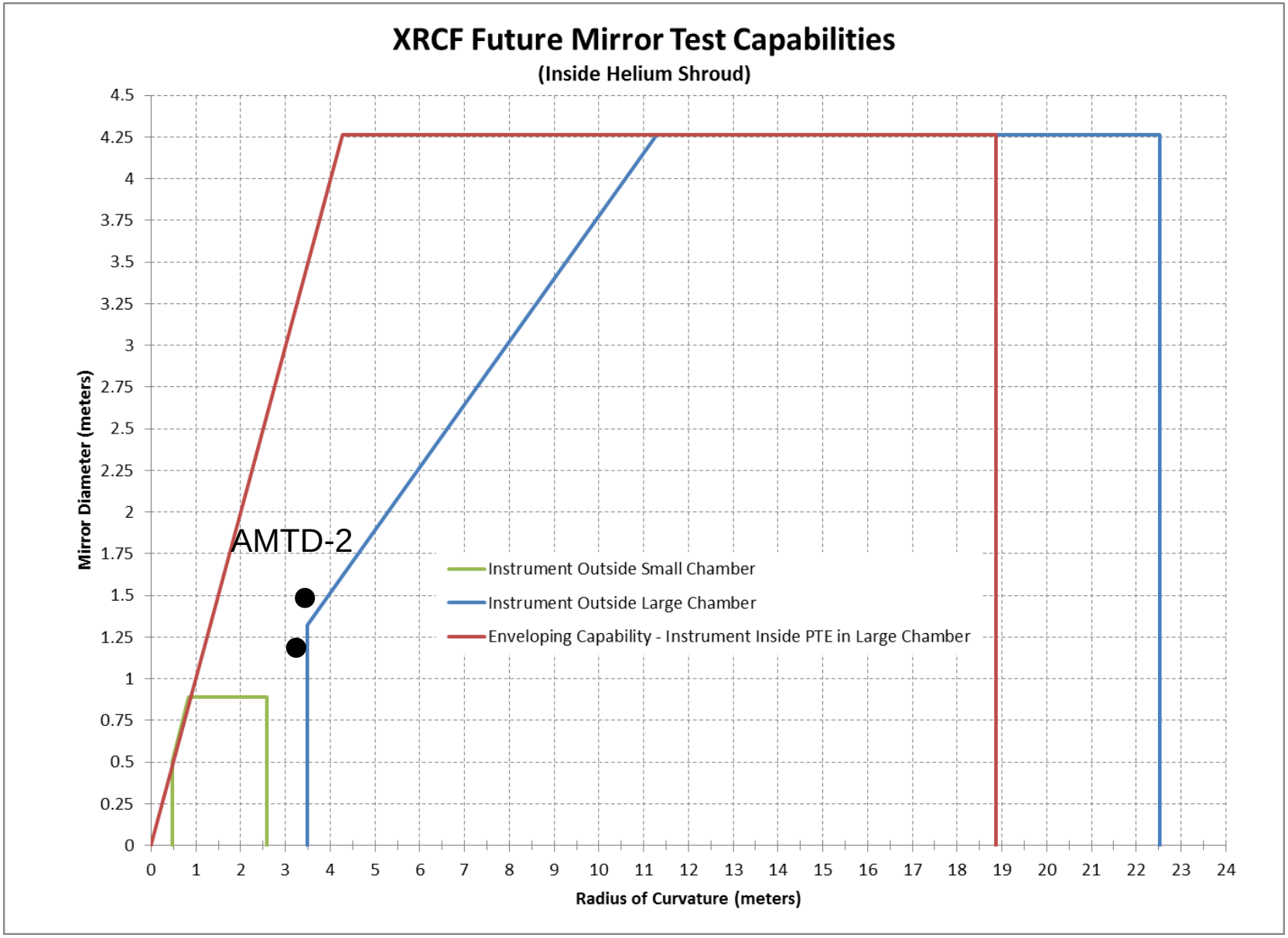
JWST mirror segments at XRCF



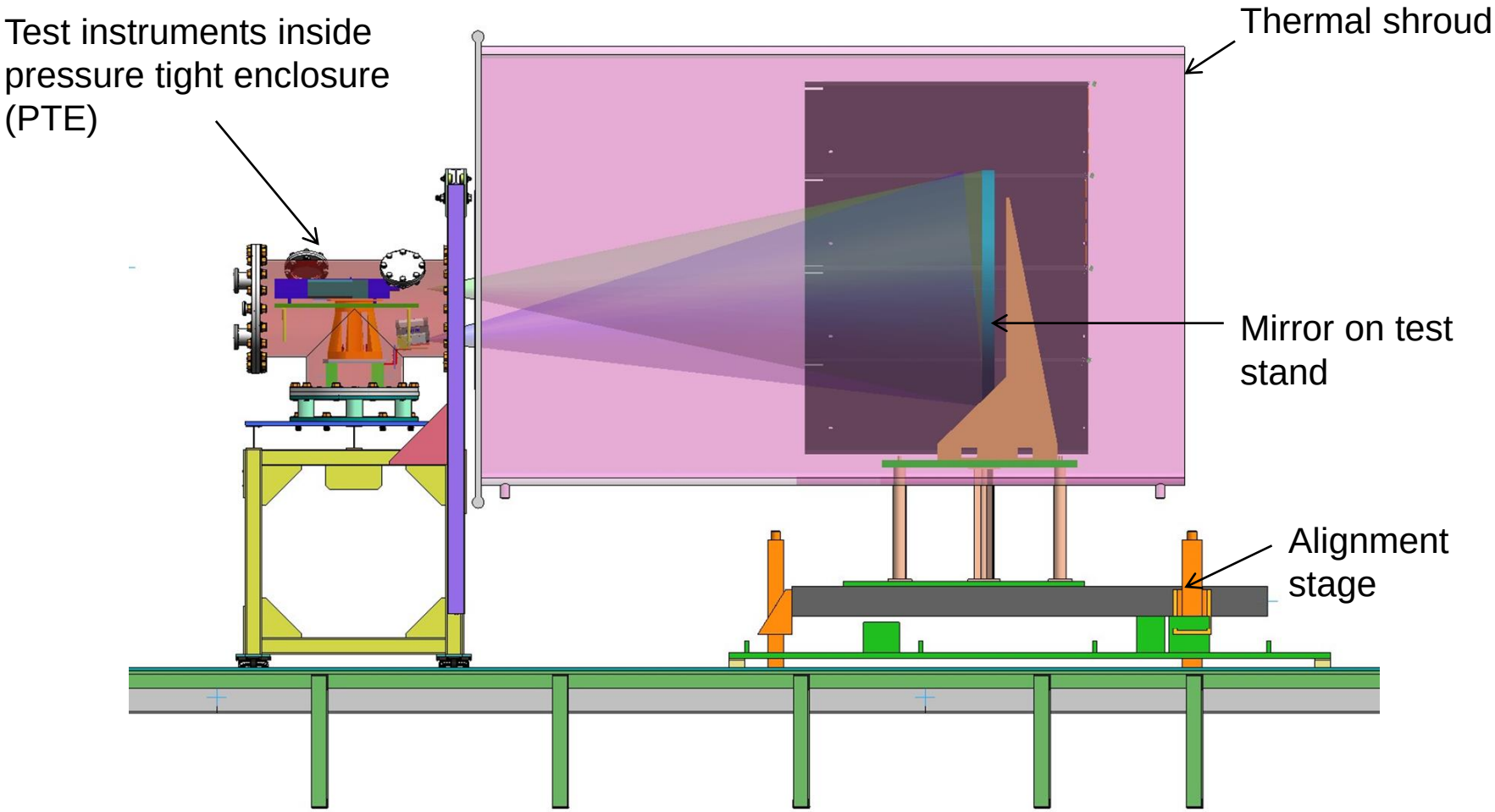
Current chamber test volume



PTE for testing short ROC mirrors

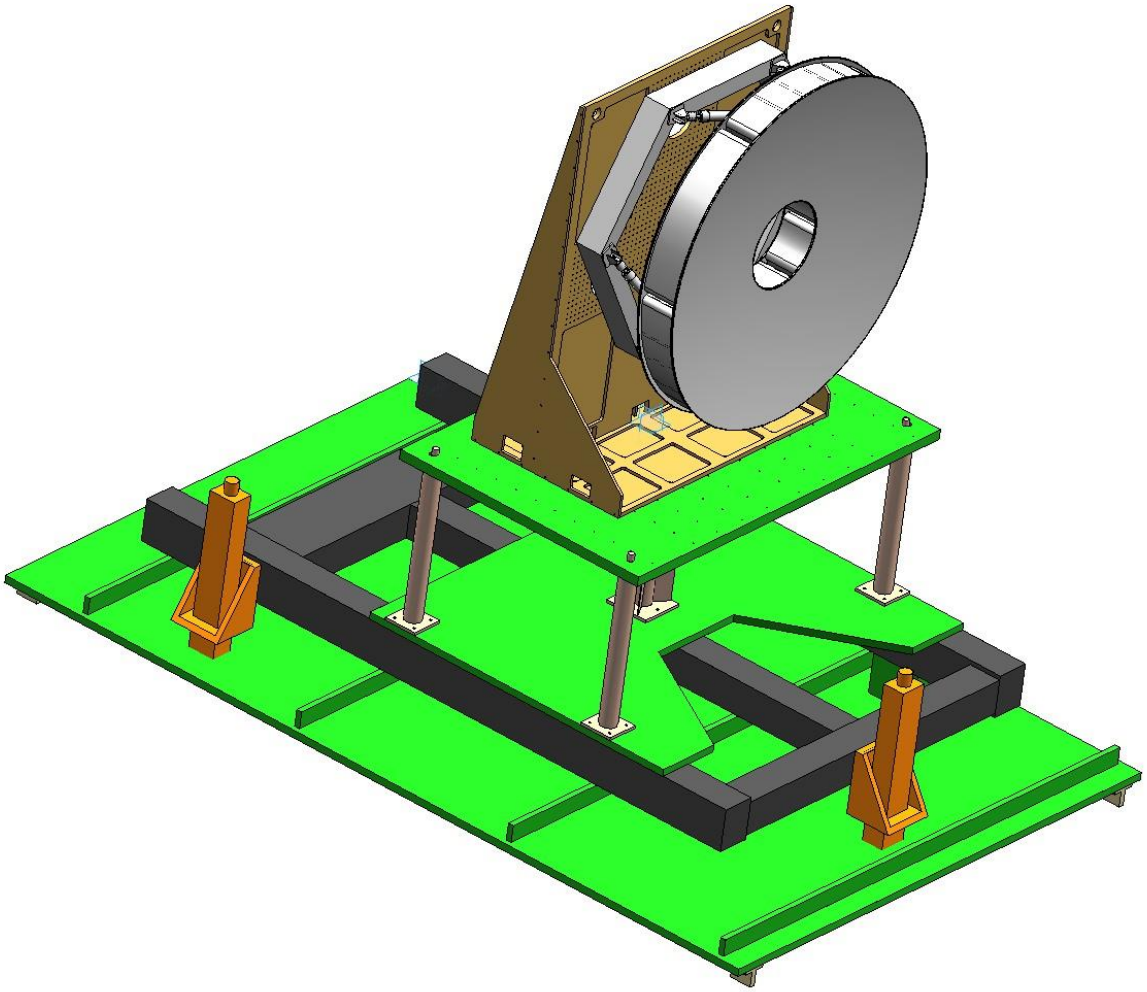


Testing short radius of curvature mirrors

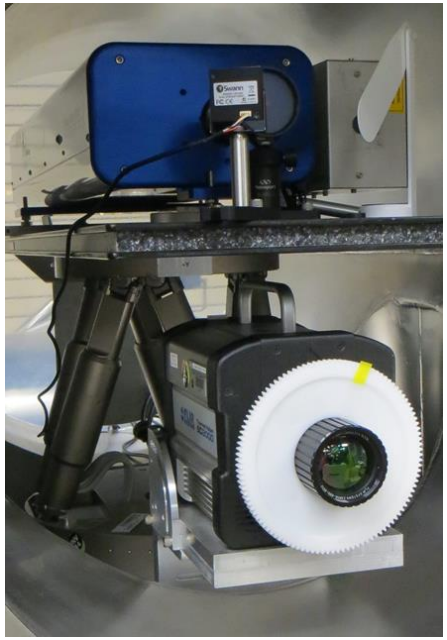


AMTD-2 test configuration with PTE

AMTD-ll mirror mounted on test stand

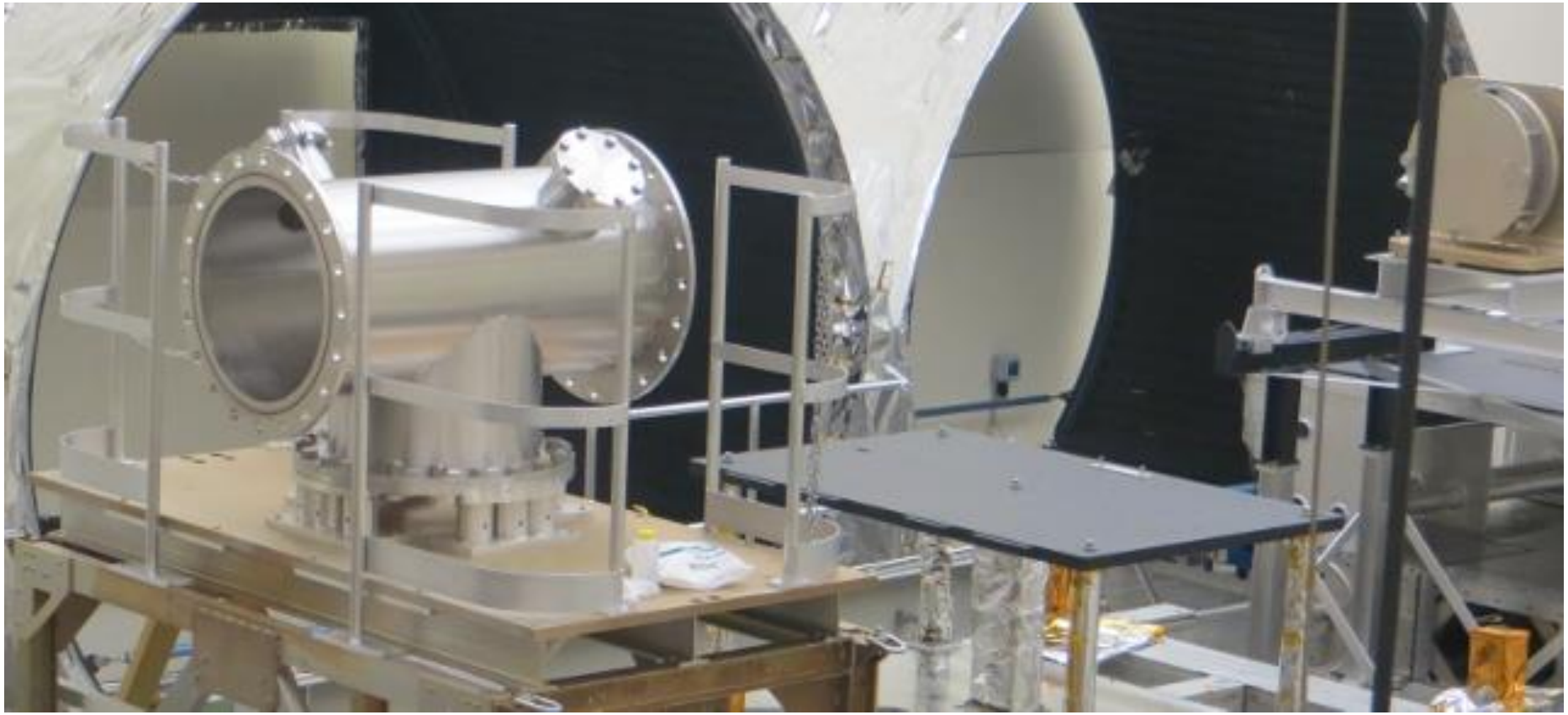


PTE with test instruments



1. alignment CCD
2. alignment pinhole
3. interferometer
4. ADM
5. IR camera stage
6. hexapod stage

Test facility modification in progress



PTE platform with personnel safety rails

6 DOF test stand platform

Modal interferometry

Finite element model (FEM) can predict vibrational modes and amplitudes, it is desirable to verify actual modal performance.

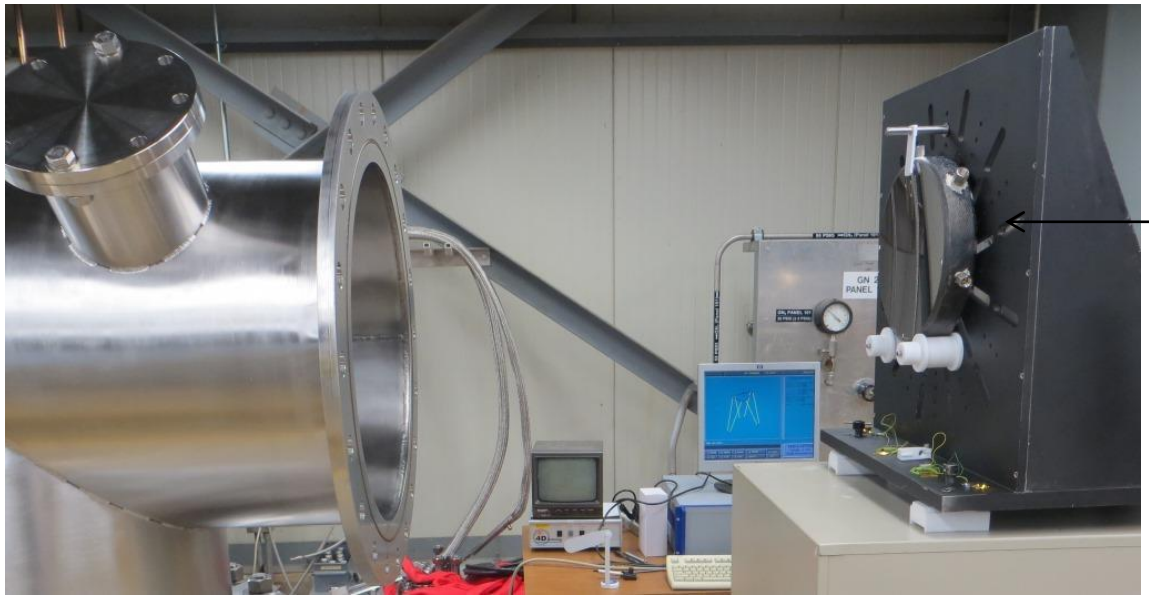
Laser vibrometer can measure single point, not entire mirror and mode shape.

4D Technology PhaseCam 5010 interferometer with modal analysis capability.

Characterize the vibrational mode shapes and measure amplitudes at different thermal parameters.

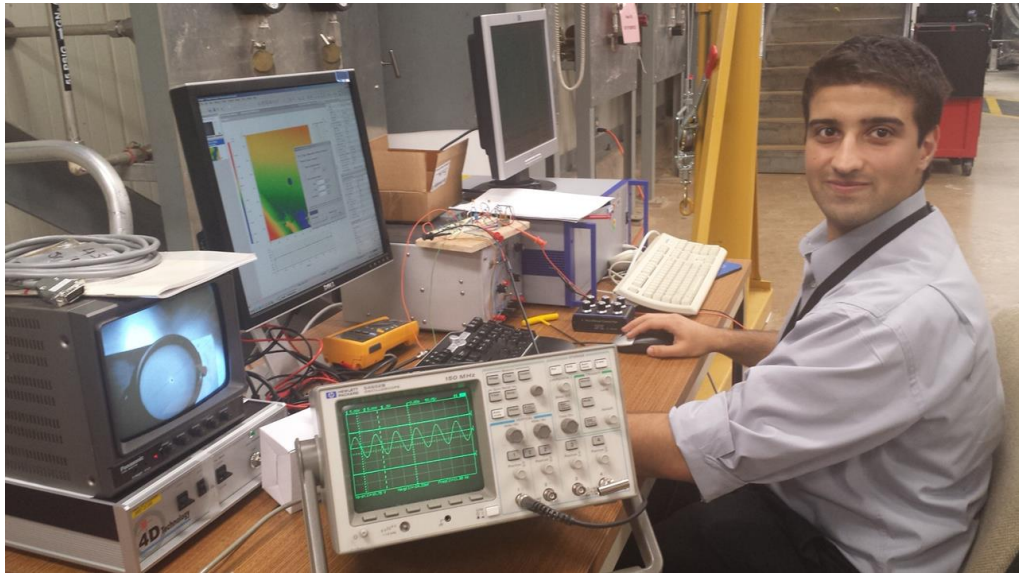
Modal interferometry measurements to validate FEM model.

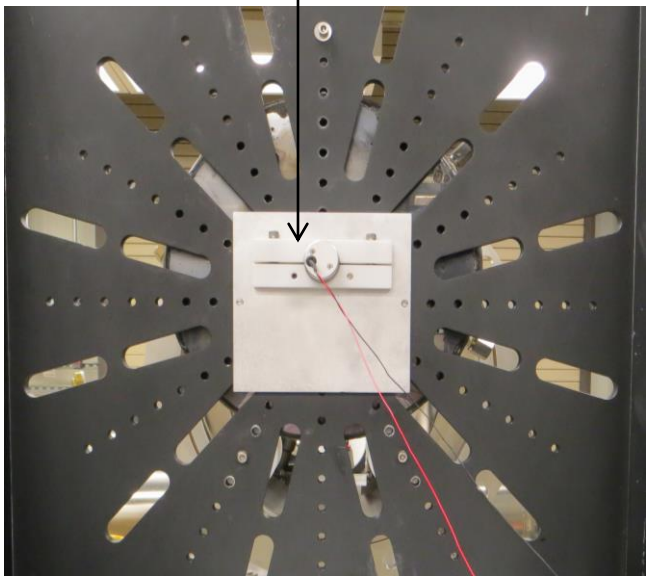
Modal interferometry test setup



SiC mirror

Voice coil transducer





Summary

AMTD-2 1/3 scale of 4 meter diameter lightweighted mirror.

Corning ULE mirror (Harris) and Zerodur (Schott) will arrive at MSFC in 2016 for testing.

Enhance existing test facility to test short radius of curvature mirrors.

Enhance optical figure testing with modal interferometry capability.

Perform testing at different thermal parameters to validate integrated model.