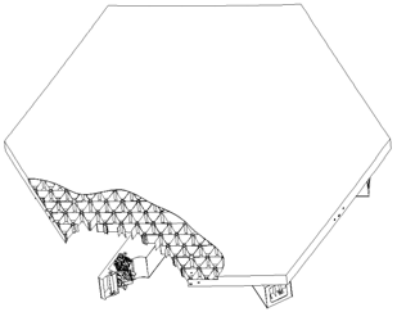
Advanced Mirror System Demonstrator (AMSD) Phase II

Beryllium Semi-rigid Mirror Ambient & Cryogenic Test Plans



Ball Aerospace & Technologies, Inc.

22 May 2002

Ambient and Cryogenic Optical Test

- Ambient optical testing
  - Surface figure using interferometric techniques
    - Substrate only
    - Partial assembly
    - Full Assembly
    - No gravity off-loading
    - With gravity off-loading
  - ROC
    - Profilometry
- Cryogenic optical testing
  - Surface figure using interferometric techniques
    - Full assembly
    - With gravity off-loading
  - ROC
    - Lieca

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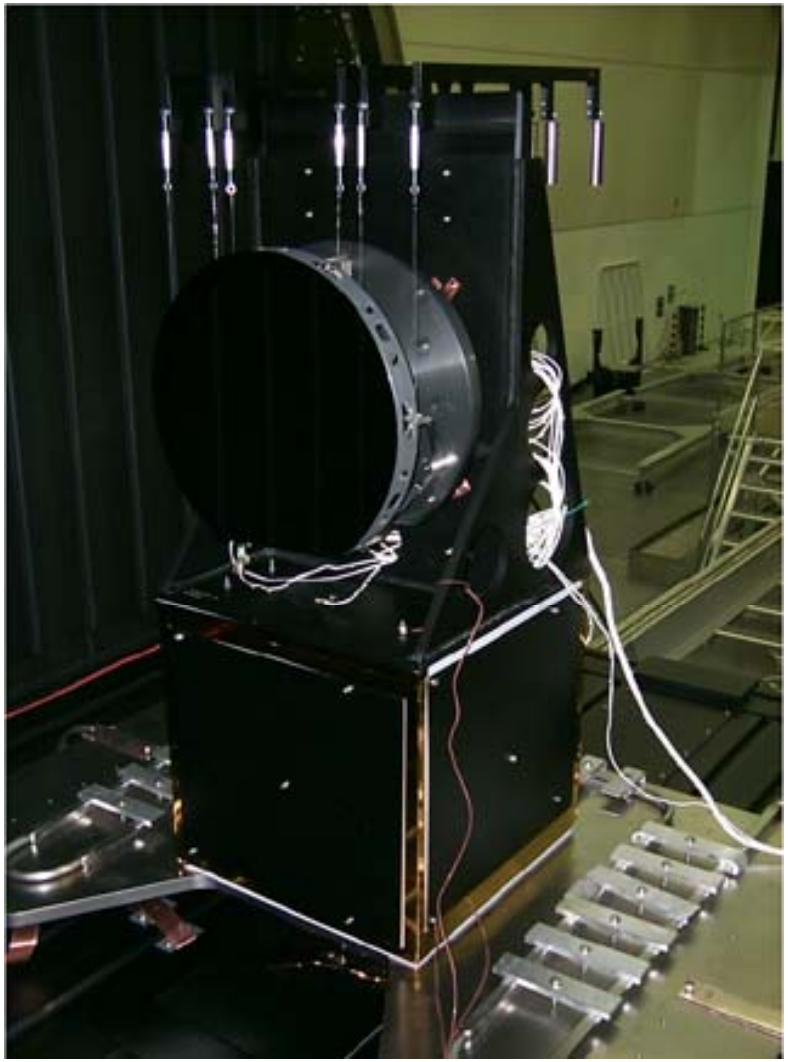
Gravity Removal Offloading Successfully Demonstrated on SBMD



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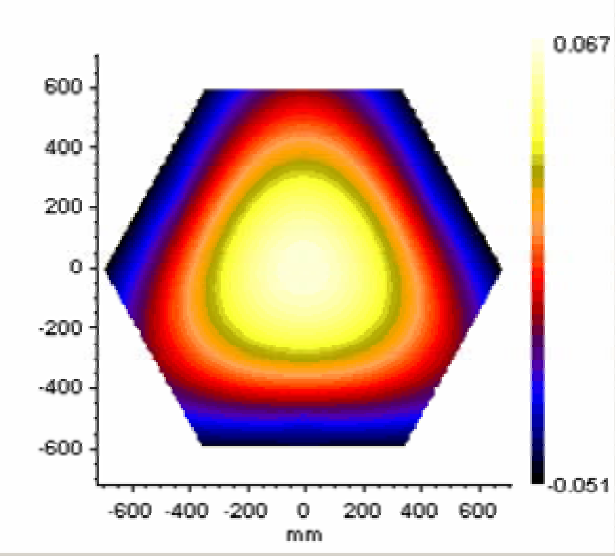
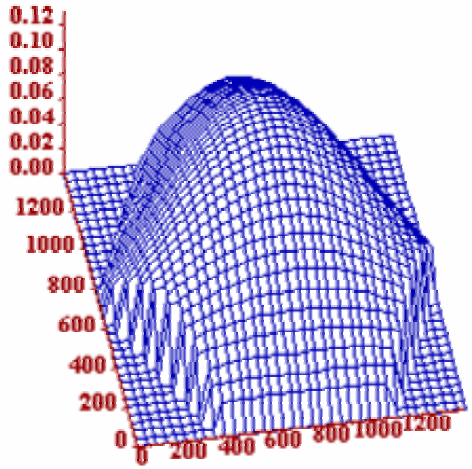
Residual Surface Figure Error With Gravity Off-loading





RMS: 0.0329 microns
PV: 0.1190 microns
Terms Removed: piston tilt

9.8 nm rms with power removed

Zernikes:

	Coefficient (microns)	Residual
Zero Order		
1 Piston	-1.3233	0.0336
1st Order		
2 X-Tilt	-0.0123	
3 Y-Tilt	-0.0074	
4 Power	-0.0580	0.0098
3rd Order		
5 X-Astigmatism	-0.0010	
6 Y-Astigmatism	-0.0000	
7 X-Coma	-0.0000	
8 Y-Coma	0.0000	
9 Spherical	0.0086	0.0091
5th Order		
10	-0.0000	
11	-0.0321	
12	0.0001	
13	0.0000	
14	0.0000	
15	0.0000	
16	-0.0010	0.0017
7th Order		
17	-0.0000	
18	-0.0000	
19	-0.0000	
20	0.0064	
21	-0.0000	
22	-0.0000	
23	0.0000	
24	-0.0000	
25	-0.0005	0.0003
9th Order		
26	-0.0000	
27	0.0001	
28	0.0000	
29	0.0000	
30	-0.0000	
31	-0.0001	
32	0.0000	
33	-0.0000	
34	0.0000	
35	0.0000	
36	0.0000	0.0003