

Cryogenic optical performance of a light-weight mirror assembly for future space astronomical telescopes: optical test results and thermal optical model

Ron Eng, William Arnold, Markus A. Baker, Ryan M. Bevan, James R. Carpenter, Michael R. Effinger, Darrell E. Gaddy, Brian K. Goode, Jeffrey R. Kegley, William D. Hogue, Richard D. Siler, W. Scott Smith, H. Philip Stahl, John M. Tucker, and Ernest R. Wright

NASA Marshall Space Flight Center

Charles S. Kirk, Craig Hanson, Gregory Burdick, Steven Maffett

Exelis Inc. Rochester, NY

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ABSTRACT

A 40 cm diameter mirror assembly was interferometrically tested at room temperature down to 250 degrees Kelvin for thermal deformation. The 2.5 m radius of curvature spherical mirror assembly was constructed by low temperature fusing three abrasive waterjet core sections between two face sheets. The 93% lightweighted Corning ULE mirror assembly represents the current state of the art for future UV, optical, near IR space telescopes. During the multiple thermal test cycles, test results of interferometric test, thermal IR images of the front face were recorded in order to validate thermal optical model.