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Marshall Space Flight Center

Thermal and Structural Modeling of Superinsulation

Technical data on the feasibility of modeling thermal and structural performance of space telescopes, using basic analytical and experimental approval, has been compiled. Thermal modeling of large space telescope systems was based on a scale model of the 2-meter Optical Technology Apollo Extension System (OTES) space telescope experimentally associated with the LEM vehicle. Investigations were made into such thermal design parameters as insulation quality, structural member conductance, thermal control coating surface properties and sun shutter operating factors. It was shown that model tests compared favorably with analytical predictions and reinforced the premise that a passive thermal control technique would suffice for thermal control of telescope interiors.

One advantage of such a model is that it permits direct physical measurement of the thermal response of critical components, thus providing flexibility for systems studies and design changes.

Note:

The following documentation may be obtained from:

National Technical Information Service
Springfield, Virginia 22151
Single document price $3.00
(or microfiche $0.95)

Reference:
NASA-CR-98241 (N69-16957), Thermal and Structural Modeling of a Large Aperture Space Telescope

Patent status:

No patent action is contemplated by NASA.

Source: R. E. Rolling, K. N. Marshall, and D. O. Murray of
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