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Heat-Rejection Windows for Telescopes

Heat-rejection windows have been constructed for telescopes to reflect incident solar energy outside the hydrogen-alpha line while processing a peak transmission exceeding 50% at 6563 Å. The original requirement was telescope windows for monitoring of the solar disk at the hydrogen-alpha line; they were to reduce the solar heat load at the entrance apertures of the telescopes.

The newly designed window comprises two elements mounted in a cell of aluminum alloy. The outer element is primarily an ultraviolet reflector transmitting visible and near-infrared incident solar energy. The inner element bears a multilayer dielectric coating that transmits 80% of incident sunlight in a 300-Å passband centered near 6563 Å. Energy beyond the main spectral band is almost wholly reflected (reflectance is 0.99 between 4100 Å and the far infrared). A window's secondary function is as a secondary blocking filter to a telescope's Fabry-Perot filter.

Fused silica is the substrate of both elements; it was chosen for its transmission properties and its resistance to browning by radiation. The outer ele-

ment is made necessary by the fact that the high-index dielectric material on the inner one shows considerable absorption at wavelengths shorter than 4000 Å. Coatings have been uniformly deposited over 8-in.-diam clear apertures with equipment for automatic control of rate and thickness.

Note:

Requests for further information may be directed to:

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Patent status:

Inquiries about obtaining the rights for commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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