

Technical Report No. 15

IR THERMOGRAPH STUDY OF CTIO TELESCOPES

Preliminary Report

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Summary

From 26-29 December 1983, at the invitation of CTIO, I examined the four largest telescopes at CTIO and the general mountain environment at CTIO with a 8-12 μm infrared thermograph. The purpose of this examination was to locate possible sources of seeing associated with equipment, telescope, building, and outside environment. We identify, after a preliminary examination of the videotapes, the following potential sources of seeing: (a) the oil bearings of the 4 meter telescope and the associated heating of the horseshoe, (b) the cassegrain cage of the 4 meter, (c) some heating from structures around the walls of the 4 meter dome, (d) the walls of the buildings of the smaller telescopes (both inside and outside), (e) the electronics inside the domes of the smaller telescopes, and (f) the concrete surfacing on the mountain top. Suggestions are made as to how to reduce these sources of seeing and as to further tests to be made.

Equipment

I used an Inframetrics Model 525 Thermograph which covers the 8-12 μm spectral range with a scanned HgCdTe liquid nitrogen cooled detector. The field of view is $14^\circ \times 18^\circ$ but is occasionally reduced to as little as $3.5 \times 4.5^\circ$ with the electronic zoom adjustment. The image is delivered in standard US RS330 compatible television format (525 horizontal lines/frame at 30/60 Hz frame/field rate) and was originally recorded on a VHS portable tape recorder. The resulting VHS tapes were copied to Betamax format for CTIO use. The VHS tapes were taken back to the USA and are available for CTIO use when needed. The equipment was identical to that used at the MMT in 1980. The results of the MMT experiments are described in MMT Technical Report No. 10 (TR10).

Summary of Data

Almost all observations are recorded on videotape with voice track explaining the observing parameters. The videotapes contain occasional isotherm images as well as video line extraction and (x,y) plots of T vs position along the line. The first two tapes (12-20-83A and 12-26-83A) contain at the beginning a demonstration of the camera and its isotherm and line scan features.

Table I below summarizes the 6 video tapes with data.

Table I

<u>Date</u>	<u>Tape I</u>	<u>Content</u>
20/21 Dec 83	12-20-83A	Survey of KPNO 4 meter telescope made to check out equipment and for comparison with CTIO 4 meter telescope.
26/27 Dec 83	12-26-83A	Evening and night survey of CTIO 4 ^m telescope and outside area.