



MULTIPLE MIRROR TELESCOPE OBSERVATORY

Smithsonian Astrophysical Observatory *and* Steward Observatory, University of Arizona

Reply to: MMT Observatory
University of Arizona
Tucson, Arizona 85721
(602) 621-1558

MMTO Technical Memorandum 84-2

From: Keith Hege, Jacques Beckers

Date: April 2, 1984

Subject: Effects of Wind Loading on Telescope Pointing

The purpose of this brief note is to share the results of a simple experiment which demonstrates perturbation of telescope pointing due to wind loading. In an attempt to understand some of the non-reproducible effects in our telescope optical pathlength measurement results, we investigated telescope pointing as a function of azimuth for each telescope individually for a set of stars at similar (within $\pm 10^\circ$) elevations near 60° . During these tests the wind was reasonably steady at about 40 mph from about 300° . The results are shown in Figures 1 and 2.

The procedure was to start with the telescopes coaligned (point stacked) and mount offset zero. Then move to next star. Using manual offset mode, the image of each telescope in succession was placed in the instrument aperture (the full video field was about $3/4 \times 1$ arc-second) using the mount paddle and the required offsets were recorded. Although this experiment was done only once, and there were mount periodic errors of about 1 arcsec p-p (which accounts for some of the scatter in these points), surprisingly large amplitude (from 4 to 9 arcseconds) excursions were noted with the effect peaking into the wind. The effect did not seem completely symmetric; other experience during the night suggested "discontinuous" changes as the telescope crossed the wind. In this experiment there seems to be evidence for a hysteresis effect; the system does not return to its original configuration when returning to the original azimuth. In both experiments, telescope C and F (an "opposite" pair) showed the largest effects.

It may be significant to note that the secondary light baffles were in place during this run. They may be effective as "sails" in making the individual telescopes particularly sensitive to this sort of wind loading.



