

Technical Report No. 16

Polarimetry on the MMT

Steve West

Overview:

Recently, on the 200" at Palomar, it was discovered that BL Lac (16th mag) had polarimetric variations of up to 2 percent in as little as 15 - 30 minutes. One minute integrations on this instrument were sufficient to achieve a polarimetric accuracy of 0.2 percent. However, considering the distance to the telescope, and availability of time to outsiders, it would be useful to carry out observations of this type from Steward.

The 200" collects almost five times as much light as the 90", but only about 1.3 times as much as the MMT. Considering this fact, one finds the MMT has the light gathering capabilities to conduct accurate, short time scale polarimetric observations of BL Lac and other faint objects. The major obstacle to overcome is the effect of instrumental polarizations arising from this instrument. The cause of these, of course, are the oblique reflections of the tertiary and beam combiner.

This report will discuss the possibilities of doing polarimetry on the MMT. As just noted, the large light gathering and resolution capabilities make the study of instrumental polarizations worthwhile. The types and magnitudes of instrumental polarizations will be calculated, then the effectiveness of a simple compensating scheme will be studied.

In order to understand the instrumental effects of the MMT on a given polarization state, it is necessary to understand reflections from a metallic layer.

Once this is accomplished, the MMT can be modelled in terms