# A LONG BASELINE OPTICAL INTERFEROMETER FOR ASTROMETRY

By

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## Abstract

A new type of astrometric instrument, the astrometric interferometer, is described. The instrument is a long baseline Michelson stellar interferometer modified to track the fringe motion caused by atmospheric turbulence. Simultaneous fringe amplitude and phase measurements at two wavelengths are used to correct atmospheric distortion when the field of view is much larger than the isoplanatic patch. Ultimately, the relative positions of stars brighter than 10 mag in a one degree field of view could be measured to 0.0001 to 0.00001 arc sec accuracy in a single observation lasting several hours. Such an instrument should have a number of interesting astrophysical and geophysical applications, such as a search for planets around nearby stars, the gravitation deflection of light, and changes in the earth's rotation axis. This thesis describes the first steps in the development of an astrometric interferometer.

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