

A Search for Variable Stars in the 2MASS Calibration Fields

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We present early results from a survey of variable stars in the Two Micron All Sky Survey (2MASS) photometric calibration fields. Photometry for the 2MASS dataset is determined from observations of calibration fields interspersed throughout the night's observations. There are **35** calibration fields on the sky, each **1' x 8'** in extent, covering a total area of **4.6 deg²**. During a typical 2MASS night sixty individual scans were taken of calibration fields. After **3+** years of 2MASS data acquisition, each field has over **3000** separate observations.

Such a dataset provides a rich source for variable star identification. The multiplicity of consistently-calibrated observations provides extensive sampling of light curves spanning periods of up to a year or more. It is particularly well-suited to identifying long-period eclipsing variables, for which eclipse events are relatively infrequent. Since the 2MASS dataset is particularly sensitive to fainter, redder stars it has the potential to provide much needed eclipsing systems at the low-mass end of the main sequence, where empirical checks of theory (via radii and mass measurements) are badly needed.

Early results are promising. Of the **-3400** stars used as primary and secondary standards (brighter objects initially selected for low probability of variability based on their statistically stable magnitudes), 10 were found to be variable during operational processing of the nightly data and subsequently excluded from the standards list. Of these, half appear to be eclipsing binaries. Pushing to fainter magnitudes will dramatically increase the source count and result in an extensive statistically complete catalog of variables for further study.

Abstract submitted for AAS □ meeting AAS198

Date submitted: 20010328 Electronic form version 3.0 (21 June 2000)