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PHOTCAL: The IRAF Photometric Calibration Package

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The IRAF photometric calibration package PHOTCAL is discussed. PHOTCAL is a set of tasks designed to derive the transformation from the instrumental photometric system to the standard photometric system, and apply the transformation to the observations. The PHOTCAL package contains tasks for: 1) creating and/or editing standard star catalogs and observations catalogs, 2) creating, checking and editing the configuration file which specifies the format of the standard star and observations catalogs and the form of the transformation equations, 3) solving the transformation equations interactively or non-interactively using non-linear least squares fitting routines, and 4) applying the transformation to the observations.

PHOTCAL standard star and observations catalogs are simple text files, whose columns are delimited by whitespace, and whose first column contains the star names. This format makes it relatively easy to interface the output of non-IRAF photometry programs as well as the output of the IRAF APPHOT and DAOPHOT photometry packages to PHOTCAL. PHOTCAL maintains a standard star catalog directory for the convenience of the user, but users can easily create their own standard star catalogs and/or define their own standard star catalog directory. Separate observations files produced by APPHOT, DAOPHOT or a user program containing data for stellar fields taken through different filters, can be combined into observations catalogs using one of the PHOTCAL preprocessor tasks.

The input configuration file required by PHOTCAL is a text file, consisting of a series of instructions written by the user in a mini-language understood by the PHOTCAL parser. These instructions: 1) assign names to the input data columns in the standard star and observations catalogs, 2) assign names and initial values to the parameters to be fit, 3) define and describe how to solve the transformation equations. The mini-language approach permits great flexibility in the format of the input catalogs and the form of the transformation equations.