TIME-RESOLVED CCD-PHOTOMETRY OF PLANETARY NEBULA NUCLEI

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The enormous potential of direct imaging CCDs with respect to stellar photometry was soon discovered after these detectors became available for standard instrumentation at modern telescopes. Among favourable properties like high quantum efficiency, linearity, and large dynamic range the multiplexing advantage of the 2-dimensional detector has permitted to perform quantitative work that otherwise would have been impossible with classical photoelectric photometry. Striking examples for this are the progress in constructing colour magnitude diagrams for globular clusters (see e.g. Hesser et al. 1987, their Fig.9) or the high precision (down to the m-mag level) achieved in differential photometry on ensembles of stars (Gilliland and Brown 1988). Several groups have also used CCDs for time series measurements employing specialized instruments and/or proper observing strategies (Dunham et al. 1985, Howell and Jacoby 1986, Stover and Allen 1987). If high time resolution (on the order of seconds or less) is required, however, the photoelectric method is still superior to CCDs mainly because of problems like data rates and readout time overhead (Barwig 1987).

Motivated by the participation in a global photometric campaign on the central star of NGC1501 (Bond et al., 1992) and by specific interest from two working groups studying stellar atmospheres of hot stars and cataclysmic variables we have started to experiment with time-resolved photometry using a CCD camera system which has lately become available for the 0.8m telescope on Wendelstein Observatory (Roth 1990, Roth et al. 1991).

We present three examples for preliminary results that have been obtained recently. Despite the disadvantages mentioned above the CCD is particularily useful for measuring stars embedded in crowded fields or nebulosities where aperture photometry is likely to fail.

References

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