

Stellar Content of the Young Open Cluster NGC 6823

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Abstract. The preliminary results of the CCD search for variable stars in the very young open cluster NGC 6823 are presented. About ten new variable stars were discovered. The most interesting finding is that of the two pre-main sequence (PMS) δ Scuti-type variables. Because the evolutionary rate of period change is large at the PMS stage, these stars could be used in the future for testing it observationally.

The open cluster NGC 6823 is the central object of the Vul OB1 association surrounded by the reflection nebula NGC 6820. The cluster is probably no older than 5 Myr (Turner 1979; Sagar & Joshi 1981) and contains a few O-type stars. It has also a large and variable reddening ($E(B - V) \approx 0.7 - 1.1$ mag).

The cluster was observed within our program of searching for B-type pulsators in the Northern Hemisphere young open clusters. We used the 60-cm Cassegrain telescope at the Białków Observatory equipped with a $4' \times 6'$ field-of-view CCD camera and an autoguider. The search frames were taken through V and I_C filters during 19 and 12 observational nights in 1998 and 1999, respectively. The preliminary results presented here are based on the 1998 data only. The full analysis, including also the 1999 data, will be published elsewhere.

Out of nearly 300 stars searched for variability, about ten appeared to be clearly variable. These include two short-period variables of about $V = 14.6$ mag. These are: a monoperoiodic ($P = 0.0719$ d) star, number 55 in Grubissich (1960); and a double-mode (0.0786 and 0.0605 d) star, which is the 57th star in the photographic sequence of Hoag et al. (1961). We have also discovered a few candidates for SPB stars among cluster B-type stars.

By means of the $H\alpha$ photometry, all stars brighter than $V \approx 16$ mag were searched for the presence of $H\alpha$ emission. One object with strong $H\alpha$ emission was found in the field. This is star 64 of Grubissich (1960) which is also a periodic variable. Therefore, it is likely to be a cluster λ Eri star.

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References

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Pulsating White Dwarfs and Subdwarfs