COMMISSIONS 27 AND 42 OF THE IAU
INFORMATION BULLETIN ON VARIABLE STARS
Number 4204

Konkoly Observatory
Budapest
6 June 1995
HU ISSN 0374 – 0676

A SUSPECTED K3V VARIABLE[1]

LTPV-B6001 ($\alpha_{2000} = 12^h26^m33^s, \delta_{2000} = -62°51'26''$, see finder chart in Figure 1, has been used for more than 7 years as secondary comparison star for monitoring the X-ray source Wray 977 = 3U 1223–62 in the framework of the "Long-term Photometry of Variables" (LTPV) project (Sterken, 1983). Observations were carried out with the Strömgren Automatic Telescope at ESO La Silla, using a 4-channel *uvby* photometer. The mean values of 41 measurements in the so-called "system 7" (closely corresponding to the natural system, see Manfroid et al., 1992 and Sterken et al., 1993) are $V = 9.687 \pm 0.001$, $b\text{-}y = 0.892 \pm 0.001, m_1 = 0.461 \pm 0.002, c_1 = 0.278 \pm 0.006$. No other *uvby* photometry, nor Geneva colours are available from the literature. All data discussed here have been published by Manfroid et al. (1991, 1994) and Sterken et al. (1995).

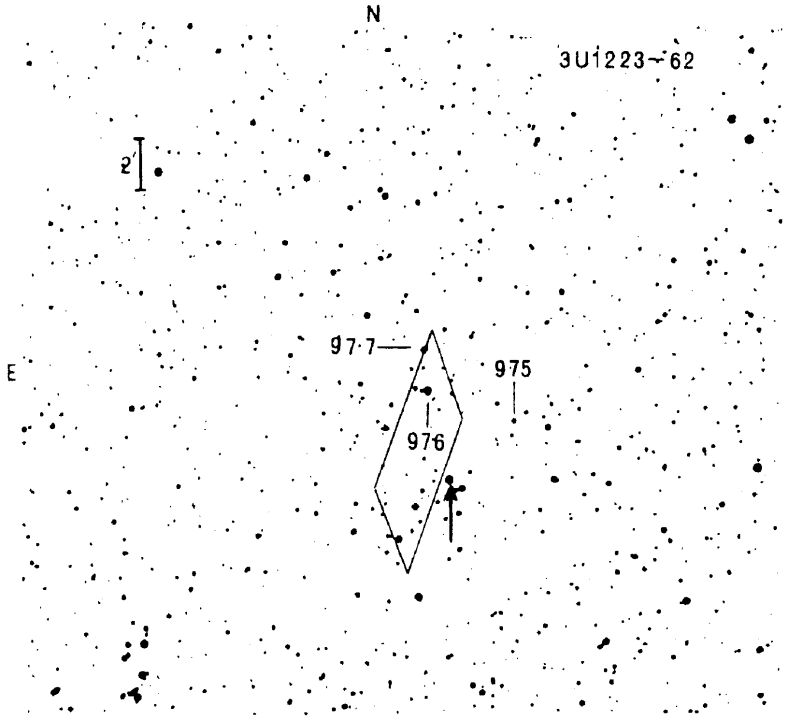

Figure 1. Finder chart for B6001, the position of Wray 977 and the error box of 3U 1223–62 is indicated (source: Vidal 1973)

[1] BASED ON OBSERVATIONS CARRIED OUT AT THE ESO LA SILLA OBSERVATORY

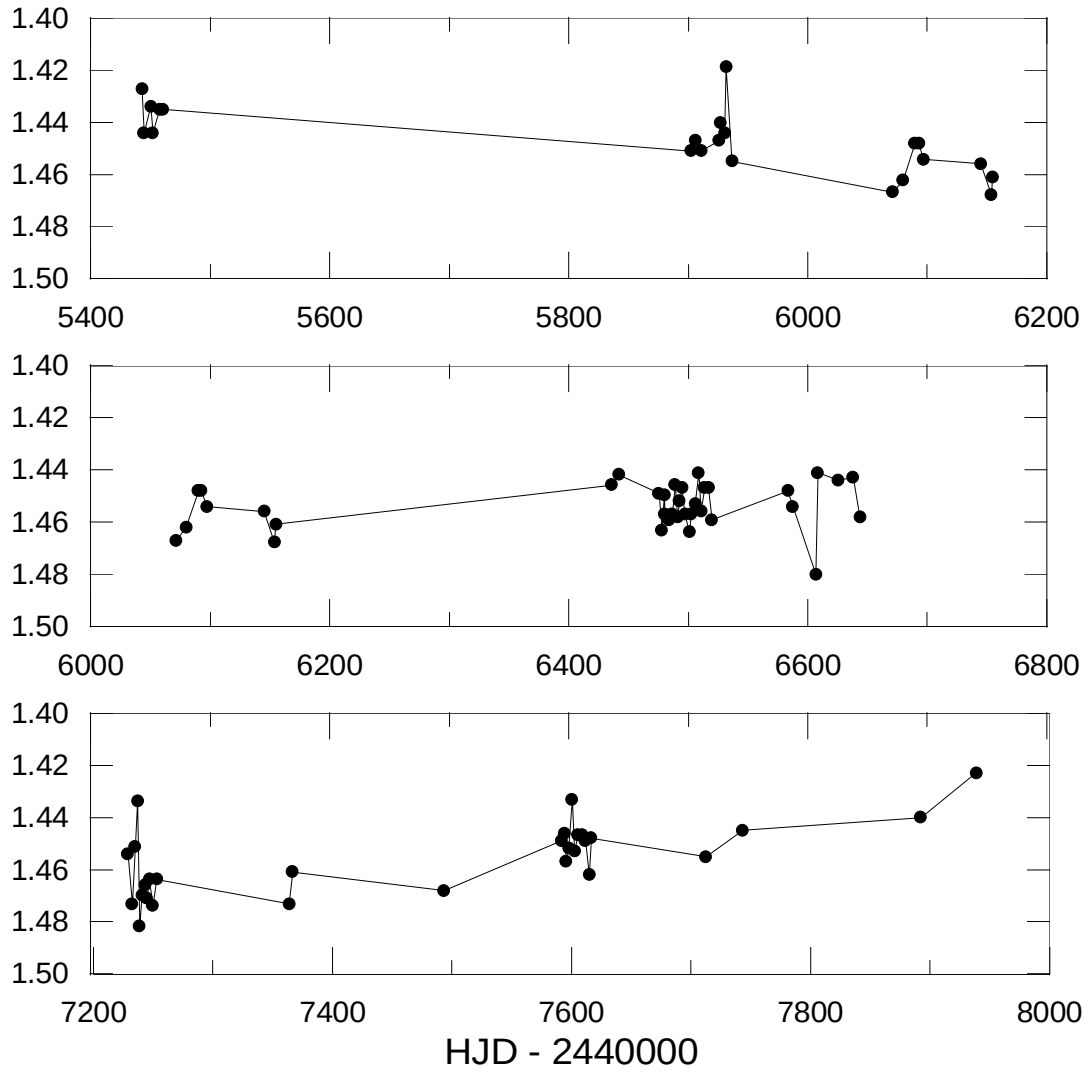

Figure 2. Differential y light curve (in the instrumental photometric system) with respect to comparison star HD 108531 ($V = 8.226, b-y = 0.056, m_1 = 0.083, c_1 = 0.712$)

Though the very small mean errors (due to the large number of measurements) may suggest that the star is a constant star, an inspection of the differential y light curve in Figure 2 shows it is not: besides some spike-like events, a long-term variation with amplitude of several hundredths of a magnitude is seen (the high-frequency noise is observational scatter). The amplitude of variation increases towards shorter wavelengths, though most of the increase in amplitude (and scatter) must be attributed to photon noise since the photon flux drops by more than a factor of 40 from y to u. Another complication that arises in the bluer bands is the magnitude of the conformity errors that may arise when combining data from non-congruent photometric instrumental configurations (note that the star is much redder than the comparison star HD 108531). This problem, however, does not affect our interpretation, since Figure 2 is constructed with non-transformed data—that is, data in the instrumental system.

The accurate mean colour indices allow estimation of the star's spectral type and luminosity class. We obtain $u-b = 2.984$ and the reddening-free indices $[m_1] = 0.755, [c]_1 = 0.100$. This locates B6001 on the locus of 14 *uvby* standards and 142 stars within 25 pc given in the $[c_1], [m_1]$ diagram in Fig. 6 of Olsen (1984), and at the extreme end in the $b-y, u-b$ diagram of these stars in his Fig. 7, quite close to the location of HD 95735, a star for which Olsen (1984) gives $\log T_{\rm eff} = 3.53$. B6001, according to its $[m_1]$ and $[c]_1$ indices, should have $M_{\rm V} = 6.74$ and a spectral type of about K3V or slightly later.

C. STERKEN[1]
University of Brussels (VUB)
Pleinlaan 2
B-1050 Brussels, Belgium

A. van GENDEREN
Leiden Observatory
Postbus 9513
2300RA Leiden, The Netherlands

M. BURGER
Royal Observatory of Belgium
Ringlaan 3
B-1180 Brussels, Belgium

[1] Belgian Fund for Scientific Research (NFWO)

References:

Manfroid, J., Sterken, C., Bruch, A. et al., 1991, First Catalogue of Stars Measured in the Long-Term Photometry of Variables Project (1982–1986), ESO Sc. Rep. No. 8

Manfroid, J., Sterken, C., Cunow, B. et al., 1994, Third Catalogue of Stars Measured in the Long-Term Photometry of Variables Project (1990–1992), ESO Sc. Rep. No. 14

Olsen, E.H., 1984, *AAS*, **57**, 443

Sterken, C., 1983, *The Messenger*, **33**, 10

Sterken, C., Manfroid, J., Anton, K. et al., 1993, Second Catalogue of Stars Measured in the Long-Term Photometry of Variables Project (1986–1990), ESO Sc. Rep. No. 12

Sterken, C., Manfroid, J., Beele, D., de Koff, S., Eggenkamp, I., Göcking, K., Jorissen, A., Kaufer, A., Kuss, C., Schoenmakers, A. P., Stil, J. M., van Loon, J., Vink, J., Vrielmann, S., Waëlde, E., 1995, Fourth Catalogue of Stars Measured in the Long-Term Photometry of Variables Project (1992-1994), ESO Sc. Rep., No. 16

Vidal, N.V., 1973, *ApJ*, **186**, L81