

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

Number 5058

Konkoly Observatory
Budapest
10 April 2001

HU ISSN 0374 – 0676

NEW DWARF NOVAE ON MOSCOW PLATES

KRYACHKO, T.V.

Starlab Observatory (c/o Sternberg Astronomical Institute, 13, Universitetskij Prosp., Moscow 119899, Russia), <http://www.starlab.ru>, e-mail: comet@au.ru

A search for new variable stars on Moscow archive plates resulted in the discovery of two new UG stars (TK 4 and TK 5). The coordinates of TK 5, taken from the USNO A2.0 catalog, and for TK 4, measured on a DSS image, are listed in Table 1. The finding charts are shown in Figure 1. The TK numbers of the new variables continue the numbering system first introduced in Kryachko and Solovyov (1996).

The stars were estimated by eye on plates taken with the 40-cm astrograph in the Crimea. The magnitudes of comparison stars are given in Table 2. The standard sequence in NGC 6819 (Purgathofer, 1966) was used to obtain *B*-band magnitudes of comparison stars for TK 4 and TK 5.

Both stars are blue on Palomar prints.

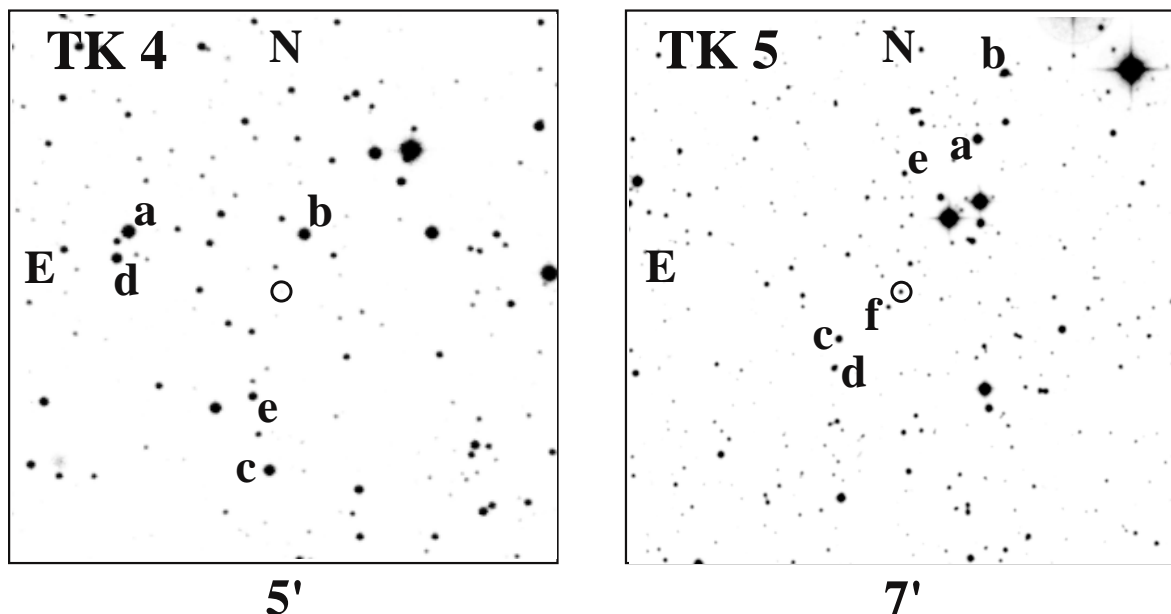


Figure 1. The finding charts and the comparison stars

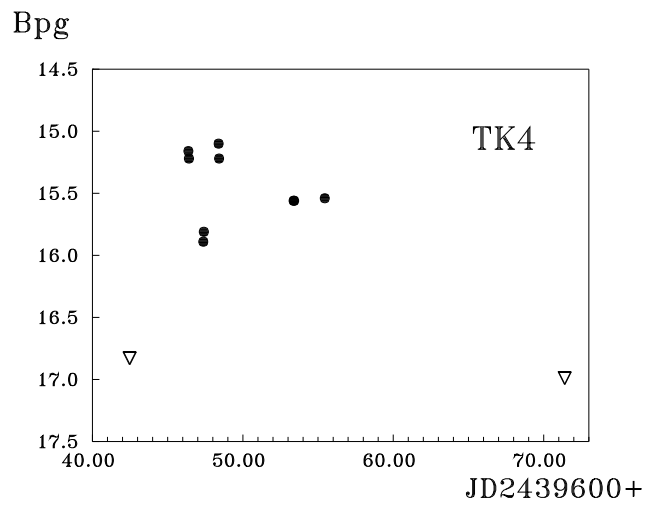


Figure 2. TK4 Lyr. The light curve of a long-lasting outburst showing a temporary fading

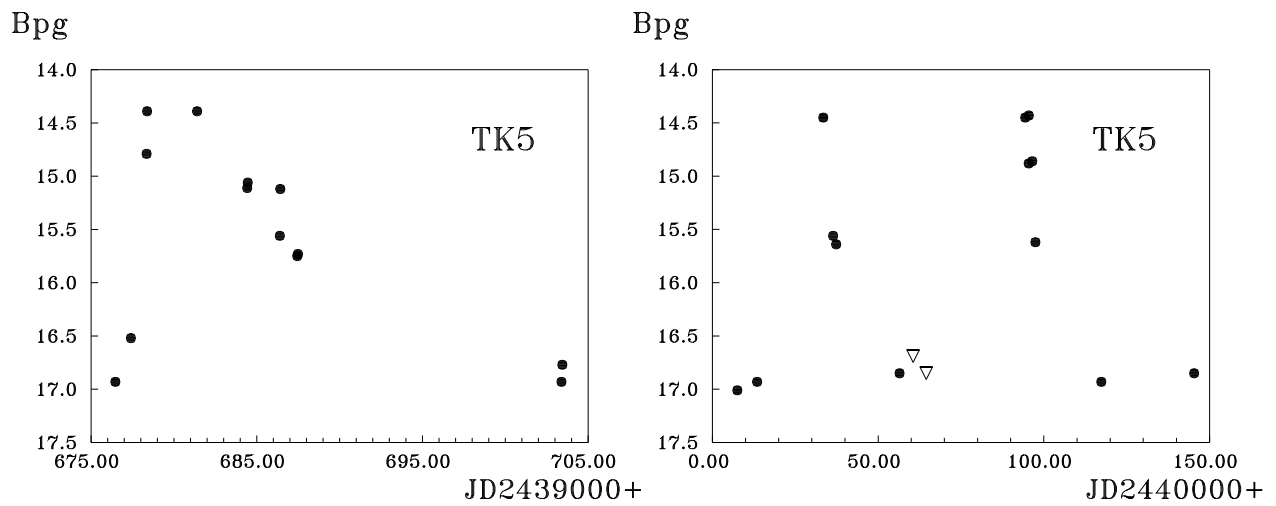


Figure 3. TK5 Lyr. Fragments of the light curve: the long-lasting outburst and two consecutive outbursts

Table 1: Coordinates of the new variables

| Var | α (J2000.0) | δ (J2000.0) |
|------|---|--------------------|
| TK 4 | 19 ^h 13 ^m 58 ^s .47 | +40°44′09″.1 |
| TK 5 | 19 ^h 17 ^m 26 ^s .5 | +37°10′41″ |

Table 2: Comparison stars

| Var | a | b | c | d | e | f |
|------|-------|-------|-------|-------|-------|-------|
| TK 4 | 14.62 | 15.34 | 15.73 | 15.94 | 16.83 | |
| TK 5 | 13.77 | 14.65 | 15.47 | 15.98 | 16.19 | 16.69 |

TK 4 Lyr. We estimated the star on 226 plates taken in JD 2439345–2444436. The range of variability on our plates is 14^m86–[17^m2. A total of three outbursts have been revealed. They belong to at least two different types: #3 is brighter and short-lasting, of less than 4 days duration, and #1 lasted more than 9 days, with a 0^m65 deep local minimum on the plato, with at least 1 hour duration. We can assume this star to be a UGSU (SU UMa subtype) dwarf nova. The light curve of the outburst #1 is shown in Figure 2. This star is missing in the USNO A2.0 catalog; in 3″ to the north-north-west, there is a USNO star at 19^h13^m58^s.41, +40°44′11″.5 (2000.0) ($B = 19.5$, $R = 18.4$). TK4 is brighter than the latter star on the blue DSS-II image and fainter on the red image.

Further observations and search for superhumps are strongly encouraged.

Outbursts (JD 24...):

| | | | | | |
|----|-----------|-------|----|-----------|-------|
| #1 | 39642.493 | [16.8 | #2 | 40033.436 | [16.8 |
| | 39646.377 | 15.16 | | 40036.406 | [16.8 |
| | 39646.413 | 15.22 | | 40037.334 | 14.86 |
| | 39647.371 | 15.89 | | 40056.477 | 16.12 |
| | 39647.403 | 15.81 | | 40060.525 | [16.8 |
| | 39648.385 | 15.10 | | | |
| | 39648.418 | 15.22 | #3 | 40386.484 | [16.8 |
| | 39653.375 | 15.56 | | 40387.450 | 14.91 |
| | 39653.407 | 15.56 | | 40387.472 | 14.98 |
| | 39655.444 | 15.54 | | 40390.469 | [17.1 |
| | 39671.379 | [17.0 | | 40392.505 | [16.8 |
| | 39671.411 | [17.0 | | | |

TK 5 Lyr. The UG-type variability was discovered on the basis of 220 estimates (JD 2439345–2444436). The *B*-band magnitude changes in the range 14^m32–[17^m1.

The star shows frequent outbursts, with a possible cycle around 60 days. Three best-observed outbursts, #1 and two consecutive ones, #4 + #5, are shown in Figure 3. The color index (blue minus red) is 0.7 in the USNO A2.0 catalog.

Outbursts on Moscow plates (JD 24...):

| | | | | | | | | |
|----|-----------|-------|----|-----------|-------|----|-----------|-------|
| #1 | 39676.465 | 16.93 | #3 | 39953.565 | 16.77 | #6 | 40412.480 | 16.93 |
| | 39677.405 | 16.52 | | 39965.391 | 15.81 | | 40413.503 | 16.85 |
| | 39678.348 | 14.79 | | 39965.498 | 15.62 | | 40425.439 | 14.32 |
| | 39678.380 | 14.39 | | 39966.469 | 15.79 | | 40427.438 | 14.50 |
| | 39681.398 | 14.39 | | 39966.498 | 15.81 | | | |
| | 39684.422 | 15.11 | | 39968.470 | 16.85 | #7 | 42988.411 | [17.1 |
| | 39684.454 | 15.06 | | 39968.495 | 16.85 | | 43046.340 | 14.32 |
| | 39686.387 | 15.56 | | | | | 43047.397 | 14.43 |
| | 39686.420 | 15.12 | #4 | 40007.495 | 17.01 | | 43049.349 | 14.47 |
| | 39687.448 | 15.75 | | 40013.490 | 16.93 | | 43050.325 | 14.40 |
| | 39687.480 | 15.73 | | 40033.436 | 14.45 | | 43064.259 | [16.9 |
| | 39703.393 | 16.93 | | 40036.406 | 15.56 | | 43065.262 | [16.9 |
| | 39703.441 | 16.77 | | 40037.334 | 15.64 | | | |
| | | | | 40056.477 | 16.85 | | | |
| #2 | 39716.467 | 16.93 | | | | | | |
| | 39716.504 | 16.69 | #5 | 40060.525 | [16.7 | | | |
| | 39734.387 | 15.73 | | 40064.517 | [16.9 | | | |
| | 39734.423 | 15.88 | | 40094.377 | 14.45 | | | |
| | 39735.339 | 15.81 | | 40095.437 | 14.88 | | | |
| | 39735.372 | 16.19 | | 40095.477 | 14.43 | | | |
| | 39735.408 | 16.29 | | 40096.504 | 14.86 | | | |
| | 39737.290 | 16.69 | | 40097.464 | 15.62 | | | |
| | 39739.370 | 16.69 | | 40117.353 | 16.93 | | | |
| | | | | 40145.351 | 16.85 | | | |

The author would like to thank Drs. S.V. Antipin and N.N. Samus for their help and attention to this investigation.

References:

- Kryachko, T.V., Solovyov, V.Ya., 1996, *Perem. Zvezdy*, **23**, No. 6, 429
 Purgathofer, A., 1966, *Wien Mitt.*, **13**, No. 2