

## Prosper – The New Observational Programme of Eclipsing Binaries

New project Prosper is introduced to a wide community of variable star observers. The project is targeted to understudied (mostly new) eclipsing binaries without known light ephemeris. The charts for visual and CCD observers are available. Contact address: [prosper@tiscali.cz](mailto:prosper@tiscali.cz)

During the last year, observers could follow sometimes heavy discussions about usefulness of visual observations. The conclusion is simple: photoelectric and CCD observations are preferred, but visual observations of all types of variable stars are truly useful! However, a care should be taken with selecting of target stars and methodology of taking observations. Observing slowly variable stars with small amplitude is appropriate only for a small number of observers. Well, let's assume I have suitable variable star with suitable maximum and minimum brightness. I calculate prediction or find it in summary available on the Internet. If the star exhibits minimum in the given night, I can start with observations. Knowing the accurate time of minimum is not always desirable as observers who are not psychically resistant are going to see the star dimmer and dimmer as it approaches the predicted time of minimum even if it is not real.

However, there is always second option. Just to go observing without knowing any prediction of the minimum of a star. So I can only observe stars of W UMa or beta Lyrae type. These stars have usually smaller amplitude than Algol stars, though. Or I can select more than one star for a night a just write down when to start observing and how often to estimate the variable to get at least 15 estimates per minimum. But there is even another possibility – I can follow only stars that should be short period eclipsers without known ephemeris. Stars with known ephemeris could be found in the BRKA catalogue, basic version. For such stars there are already calculated predictions and for a lot of them there are also finding charts. But what shall I do with the stars without ephemeris?

These stars are tabulated in the BRKA catalogue, Prospektor version. The group of observers has included some other stars and has selected a smaller subset. Finding charts for visual and CCD observers has been created for the selected stars by the courtesy of D. Motl. They can be found at <http://home.tiscali.cz/prosper>. For each season we will make publicly available a set of two or three stars together with a detailed info on each star and of course with finding charts accompanied. The style of observations should be (at least from the beginning) similar to the style of observations of semiregular and irregular variables. A few observations or just a single observation per night should suffice. If there are enough observations during the season and we are lucky, we should be able to determine preliminary ephemeris. After that, observers with CCDs or PEPs will acquire some measurements at least around the minimum. This is a result which can be published e.g. in Information Bulletin on Variable Stars. All visual observers will be, of course, co-authors of such a paper. A working scheme like this is very successful in other groups of observers.

Info on individual stars:

### KZ Dra

KZ Dra is an eclipsing binary of the Algol type. It is situated on the border of Cepheus and Draco. It is surrounded by naked-eye stars. Its advantage is also a high declination – its minimum altitude is 30 degrees above the horizon so it can be followed through the whole year. We couldn't find light ephemeris or past observations of this star. Identification, type of

variability and range of variations (11,2 – 12,4 mag in V band) were taken from [1]. Further designations of this star are TmzV131 and GSC 4446 1025 according to [2].

#### NSV 13204

NSV 13204 is an eclipsing binary, probably of beta Lyrae type. It is situated in the Milky Way just few degrees from Deneb. Owing to its high declination it can be observed through the whole year. Paper [3] gives the range of variability between 10,4 and 11,6 mag in the photographic band. The star is 12,0 mag on the V band image in the chart for CCD observers. Further designations of this star are AN 31.1938, CSV 5151 and GSC 3950 483 according to [2].

#### V1011 Her

According to [2] it is a source of X-rays. It should be an Algol type variable star in the optical wavelengths. The range of variations is 10,4 to 11,6 mag in photographic band. Further designations of this star are GSC 02106 02463 and 1RXS J182931.3+223426.

The format of observations (even individual points are useful!) should be the following (very similar to the MEDUZA format):

Column number: 1: name of the star, 11: julian date, 25: magnitude, 35: date (UT), 55: observer's abbreviation, 65: estimate(s)

Example: QR And 2451139.256 11.28 1998-11-21.756 Petr Novák E4V2F

Julian date is just an optional parameter.

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All observers who contribute to this project will be continuously informed about results. More detailed information, questions and comments should be directed to above addresses. All information about observing programme can be found also at <http://home.tiscali.cz/prosper>.

Some remarks to the charts:

Each star has two independent charts. The first chart is intended particularly to visual observers. In the upper right corner of each view port, there is shown the level of the chart by Roman numerals. In the lower left corner there is an explanation of used magnitudes and orientation. Lower parts of the view ports contain also the information about scale. Stellar magnitudes are in visual passband and are in decimagnitudes. The variable is denoted by two lines in the last view port. Lowercase letters denote preliminary comparison stars, for these stars, V band magnitudes are given on the chart.

The second chart is intended to observers equipped with CCDs. The upper view port of the chart contains close vicinity of the variable star, lower left corner contains explanation of used magnitudes and orientation. Numbers near the stars are brightness' in decimagnitudes. Box in the view port corresponds to the image in the bottom of the chart. The variable star is denoted by two lines both in the finding chart and the image. Arabic numerals give preliminary comparison star for which V and B-V were computed.

Useful tool for CCD observers could be "reference stars". They are one or more very bright stars, mostly seen by naked eye, which can be used for the setup of the telescope.

Stellar magnitudes were taken from Tycho-2 catalogue and recalculated to Johnson V using formulae supplied with the catalogue.

Charts for visual observers are shipped together with this issue of Perseus. CCD observers can find them on the Internet or they will be send to them upon request.

Be successful at the telescope!