

PHOTOELECTRIC OBSERVATIONS OF STELLAR OCCULTATIONS  
AT ABASTUMANI OBSERVATORY

A.N.Korol and V.P.Dzhapiashvili

Abastumani Astrophysical Observatory, Georgia, U.S.S.R.

1. INTRODUCTION

The occultations observations are traditional at Abastumani Observatory. About 3 years ago the work was started on the development of the observational equipment for measuring different characteristics of various events under investigations with as high efficiency as possible, but using relatively small aperture telescope. The program is in progress, so, at present, the following pulse-counting system is built and put into operation.

2. INSTRUMENTATION

OPTICS. The 40 cm f/17 refractor is used for observations.

The stabilized light source for calibration can be situated in the optical axis and replaced as well as the polarizer film.

There are 6 diaphragms (1.5" + 60") made in the glass mirror disk which can be revolved. The diaphragms are accurately calibrated. That makes it possible to calculate the background light when the investigated object is measured through two of them.

There is a microscope for field viewing, a dozen of different filters on the revolving disk and a field lens.

MEASURING EQUIPMENT. The photomultiplier, selected, can be cooled down to 30°C below of surroundings by means of thermoelectric battery. The temperature is controlled and stabilized, no matter it is necessary to cool or heat the multiplier. Hence, the thermoemission noise is negligible and the quantum, spectral and multiplier efficiency is stabilized to a considerable extent.

There is a pulse amplifier and discriminator operating up to 20 MHz and pulse counter, controlled with timer. The integration time is from 10 sec down to 30 msec.

The data-out are indicated on the display and printed with high-speed typewriter. About 33 lines/sec are printed, each of them consisting of 16 decimal characters. Thus, the current time down to 1 msec from the quartz oscillator clock is registered simultaneously with every photometric result.

The clock time is established with reference to the coordinate time signals by means of radio set.

GUIDING SYSTEM. The 25 cm f/16 refractor equipped with photoelectric device providing the off-set guiding of the telescope with accuracy better than 1" is used.

3. DISCUSSION OF OBSERVATIONS

Some dozens of events have been observed. The experience confirms a high quality of the photometry. The possibility of linear polarization, spectral and background light measurements as well as that of timing and off-set guiding makes the technique to be convenient.

The atmospheric conditions permit to carry out observations using mostly 6" and 15" diaphragms.

The accuracy of some milliseconds in event timing is achieved by means of photometric data interpolation, nevertheless the minimum integration time is 30 msec.

#### 4. FUTURE WORK

Of course, 1 msec time resolution is desired and we are going to achieve it.

After that the photometer will be put into routine programs observations, including detection of double and multiple stars.

#### ACKNOWLEDGEMENT

The authors would like to express their gratitude to the United States Naval Observatory for the occultations predictions.