

Large microlensing: history and perspectives

A. V. Byalko

L. D. Landau Institute for Theoretical Physics, 117940, Kosygin St., 2, Moscow, Russia
E-mail: byalko@landau.ac.ru

The recent observational confirmation [1,2] of microlensing (i.e., gravitational focusing of light from a distant star by a small invisible body) becomes a scientific event of rather unusual appearance: this phenomena was theoretically predicted by Einstein 60 years ago [3], its observational probabilities were analyzed by me [4] and later by Paczynski [5]. Being finally observed the phenomena reveals difficulties to become a valuable observational instrument [6]. Actually the instrumental capacity of microlensing and the information about lens bodies occur to be limited: observations of a single event cannot say definitely what are the mass and transverse velocity of the lensing body, and how far it is located — only the product of the mass and distance becomes an actual outcome of each microlensing observation. I will report the results of a statistical approach to brightness changes of distant objects resulting in multiple microlensing. The theoretical time-correlation function will be compared with that for quasars observations [7]. Finally another observational procedure will be briefly discussed: the brightness curve of a pulsar in the radio waverange can reveal a diffraction pattern which could give information on both mass and distance to the lensing object.

PACS: **98.80.-k**

1. C. Alcock et. al., *Nature* **365**, 621 (1993).
2. E. Aubourg et. al., *Nature* **365**, 623 (1993).
3. A. Einstein, *Science* **84**, 506 (1936).
4. A. V. Byalko, *Astronomicheskii Zh.* **46**, 998 (1969) (in Russian), the English translation is published in *30 Years of the Landau Institute. Selected papers*, I. M. Khalatnikov and V. P. Mineev (eds.), World Scientific (1996).
5. B. Paczynski, *Astrophys. J.* **304**, 1 (1984).
6. A. V. Byalko, *Microlensing: Statistical Approach, Astronomical and Astrophysical Trans.* **10**, 177 (1995); *Priroda* **24** (1994) (in Russian).
7. M. R. S. Hawkins, *Nature* **366**, 242 (1993).