ON THE ERRORS IN PRACTICE OF OBSERVATIONS AND THEIR REDUCTIONS

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ABSTRACT. Specifical errors are not rare in the practice of astrophysical observations. Examples of such errors are given.

Key words: observations: errors.

1. Misidentification of object

The practice of observations on modern telescopes convince us that the accurate of telescope pointing on an object is on a level of several arcsecs. The analogic accurate may characterize the definition of observable object coordinates on the sensors. If the coordinates of objects are systematic different then this, among other things, may be caused by the distinguish of these objects, i.e., we observe two different objects.

It is presented a history of the identification of V605 Aql by the IR observations of V605 Aql, which initially lead to peculiar characteristics of this variable [Rosenbush 1999; Kimeswnger et al. 2001]. The pecularity in the IR spectral energy distribution is disapeared after the correct identification.

As it seems to us the question of identification of this object do not be close yet. Kimeswenger et al. give the A58's coordinates which are also equal to V605 Aql: 19h 18m 20.42s (epoch 2000.0) 01^o 47' 01.1". At that time the IRAS's coordinates are: 19h 18m 19.9s (epoch 2000.0) 01^o 46' 49.9".

I.e., we have considerable distinguishes only in the declination which is more than the photometer's apperture size or the CCD pixel.

2. Software for the reduction of observations

The wide spreading of the software for the reduction of observations arises one more problem, connected with an re-installation of this software in other computer working with different OS.

3. On an analytical formula of the Earth's velosity

The use of high-resolution spectroscopy, in addition to others, puts in the forefront the necessity to take into consideration the nonuniform moving of the observation point. This is both the Earth's orbital velocity and the velocity of her rotation. The latter reaches 465 m/s in the equator and it needs to take into consideration only the latitude of observatory. The taking into account of the first is more complicated by the ellipticality of the Earth's obrit, and the perturbations from the Moon and the planets. For all of these corrections exist both an analytical formulae and the analytical expressions (the latter is traditional for the computer's calculations). Comparing to one another we have the possibility to chose the best.

We made this comparison for the analytical formula for taking into account the orbital velocity of the Earth from any course of practical astrophysics beginning from Vorontsov-Velyaminov (the 30-th) and ending by Martynov (the last publication in the 80-th)

$$v = V_a \cdot \cos b \cdot \sin(l_\odot - l + i). \qquad (1)$$

The ellipticity of the Earth's orbit come into the expression in two terms: the velocity V_a and the angle i. The value of the angle i varies within the limits from -57' up to 57' and the analytical formulae exists for this

$$\mathrm{tg}\, i = e \sin(l_\odot - \pi)/(1 + e\cos(l_\odot - \pi)). \qquad (2)$$

If we make the comparison between the Earth's velocity by this formulae and by any analytical expression, for example, then we find systematic difference up to +0.6 km/s. It disappears if we change the sign of i in the common formulae. The final difference does not exceed 50 km/s. In one's turn, the comparison of the Soma et al.'s expression with the more exact ephemeries given the difference not more 1.64 m/s. I.e., the common formula has the error and it needs to change the sign of i, than the formula takes the form

$$v = V_a \cos b \sin(l_\odot - l - i). \qquad (3)$$

References

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