

The building of the occultation observations base

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Abstract

The times of 430322 occultations of stars by the Moon observed during 1943-95 are analyzed to build the occultation's base. This base will make use for study modern astrometric catalogues. The Russia occultation's base is analyzed independent. As well the base photoelectric occultations are analyzed.

1. Introduction

About 430322 times of occultations made in the 1940 – 2005 are analysed in this paper. The base data of occultation observations with 1943 on 1980 were made in Greenwich observatory and It have 225121 observations [1],[2]. But within this base were not inserted Russian occultation observations. Its number is 7698. We adjusted this deficiency. We continued the making of the occultation observations base using Internet nets, printed matters and data are given by scientists National Astronomical Observatory of Japan (NAOJ). In result number of occultation observations obtained 430322.

2. Analysis base data of 430322 occultation observations

Fig 1 and fig 2 show the temporal distribution of 430322 occultation observations and distribution of occultation observations by lunation.

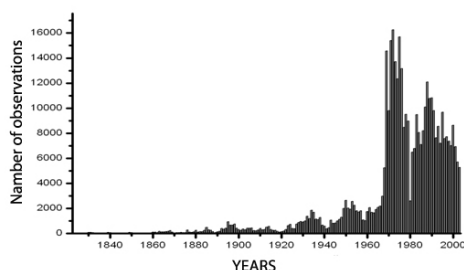


Figure 1: Temporal distribution of occultation observations.

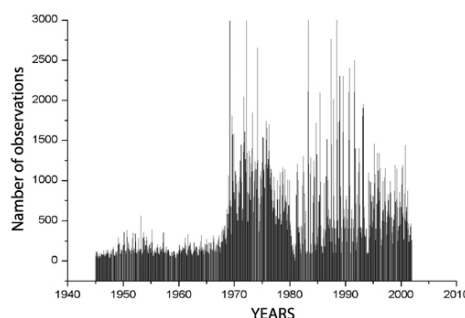


Figure 2: Distribution of occultation observations by lunation.

Fig 3 and fig 4 show the temporal distribution of occultation observations and stations observations in Russia.

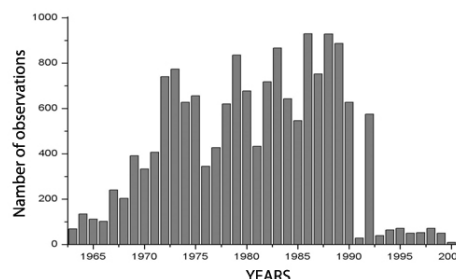


Figure 3: Temporal distribution of Russian occultation observations.

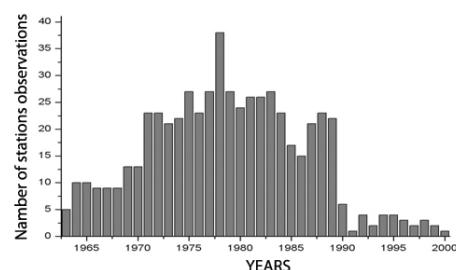


Figure 4: Temporal distribution of Russian stations observations.

There is temporal distribution of photoelectric occultation observations in the Fig 5. As we can see the number of photoelectric occultation observations increase as of 1967 year. If Morrison [3] and Soma [4] could radius only 4186 photoelectric occultations we can use 22626 such observations.

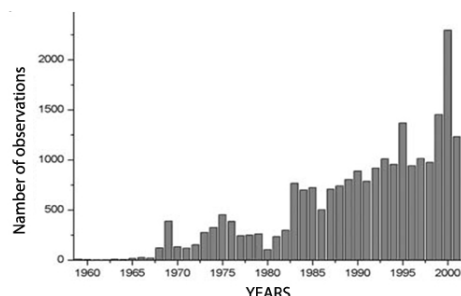


Figure 5: Temporal distribution of photoelectric occultation observations.

Fig.6 show the distribution of occultation observations within lunations. As all the timing used in this analysis correspond to disappearances at the dark limb (DD) during the first half of the lunation and reappearances at the dark limb (RD) during the second half it is to be expected that the distribution of observations in each lunation is highly correlated with the phase of the Moon and this is evident in Fig.6.

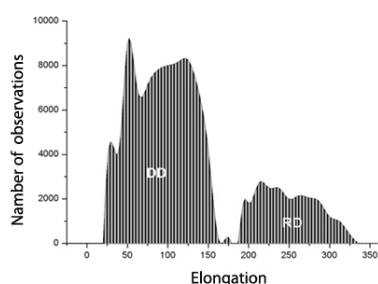


Figure 6: Distribution of occultation observations within lunations.

About 94.3 per cent of the observations were made visually using telescopes of comparatively small aperture. Of these, about 11 per cent were made by professional astronomers and the remainder by amateurs. About 5.7 per cent of the all the observations were made using photoelectric method with which the time of occultation is generally recorder with precision of 0.001s and comparable

accuracy. These observations therefore have increased weight in this analysis, but only marginally so, because of the considerable contribution to the errors from the catalogue positions of the stars and the corrections for the outline of the Moon

6. Summary and Conclusions

The base of occultation observations is one of few time series which is the long and the homogeneous. Therefore that gives us possibility to use this base for study modern astrometric catalogue by analogy with work [5].

References

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