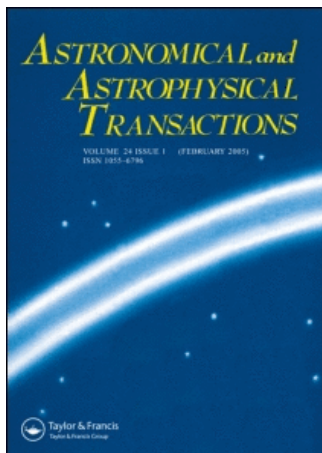


This article was downloaded by:[Bochkarev, N.]
On: 19 December 2007
Access Details: [subscription number 788631019]
Publisher: Taylor & Francis
Informa Ltd Registered in England and Wales Registered Number: 1072954
Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Astronomical & Astrophysical Transactions

The Journal of the Eurasian Astronomical Society

Publication details, including instructions for authors and subscription information:
<http://www.informaworld.com/smpp/title~content=t713453505>

On absolute determination of stellar coordinates for a new fundamental catalogue using observations from antarctica

G. M. Petrov ^a, G. I. Pinigin ^a

^a Nikolaev Branch of the Central Astronomical Observatory, USSR Academy of Sciences, Nikolaev, Ukraine

Online Publication Date: 01 January 1992

To cite this Article: Petrov, G. M. and Pinigin, G. I. (1992) 'On absolute determination of stellar coordinates for a new fundamental catalogue using observations from antarctica', *Astronomical & Astrophysical Transactions*, 3:2, 185 - 186
To link to this article: DOI: 10.1080/10556799208230558

URL: <http://dx.doi.org/10.1080/10556799208230558>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article maybe used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

ON ABSOLUTE DETERMINATION OF STELLAR COORDINATES FOR A NEW FUNDAMENTAL CATALOGUE USING OBSERVATIONS FROM ANTARCTICA

G. M. PETROV and G. I. PINIGIN

*Nikolaev Branch of the Central Astronomical Observatory, USSR Academy of
Sciences, Nikolaev, Ukraine*

(Received November 4, 1991; in final form January 6, 1992)

High-latitude observations in the southern hemisphere of the Earth are suggested to be used for compilation of a high-accuracy, catalogue of stellar absolute positions. The method of observations at high latitudes was practiced during three polar nights in 1974–1977 at West Spitsbergen.

KEY WORDS Determination of star coordinates.

Development of a highly accurate sky coordinate system represents one of the most important problems in astronomy. At present, the coordinate system is fixed by positions of stars, with their proper motion and precession constant, as given in fundamental catalogues (FC). The most precise of available FCs is the Fifth Fundamental Catalogue (FC5). But the number of systematic and occasional errors in FC5 is excessively high (Schwan, 1988).

Modern groundbased optical astrometry allows to collect enough data for creation of a new fundamental catalogue (Pinigin, 1989). It is obviously reasonable to make observations from the places where natural conditions are favorable for these purposes. Thus, determination of stellar coordinates can be better held from high latitudes during polar nights. Under these conditions, it is possible to observe stars for 24 hours with insignificant meteorological variations and the results are independent of the solar hour angle. A high position of the Celestial Pole over the horizon admits observations of stars in two culminations along a very extended meridian arc. This allows to relate exactly the observed regions to the Celestial Pole and the sky meridian. The observations are free from systematic errors inevitable at other latitudes.

The method of stellar coordinate determination at high latitudes was practiced during three polar nights in 1974–1977 at West Spitsbergen (Petrov, 1981) and the results prove to provide highly accurate absolute positions of stars in the northern hemisphere.

In the southern hemisphere, the most suitable place for precise observations of stars is the Island of Ross, where the U.S. scientific station McMurdo is situated. During one polar night, there are about 1500 hours of clear sky (Borisenkov, 1973), which provides an opportunity for successful observations. In the summer

time, at McMurdo happen days when the air temperature is above 0°C and the fundamental rock becomes free from ice. On this ice-free fundamental rock, basements for astrometric instruments requiring high stability may be installed. Installation of meridian instruments on the South Pole glaciers is less advantageous because of the ice drift.

Installation of a meridian instrument for measuring stellar coordinates at the McMurdo station might be better one of the aims of an international expedition. Creation of an astrometric instrument for high-latitude observations is quite feasible.

References

- Borisenkov, Ye. P. (1973) *Klimat Polarnykh Regionov*, Gidrometisdat, Leningrad, p. 406.
Petrov, G. M. (1981) *Astrometricheskiye issledovaniya*, Naukova dumka, Kiev, pp. 14–20.
Pinigin, G. I. (1989) *Problemy Issledovaniya Wselennoj*, **12**, 140–161.
Schwan, H. (1988) *Mapping the Sky*, Kluwer Acad. Publ., pp. 151–157.