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# **Abstract Book**



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JD2.010 P

**Possible fluctuation of the position of Sgr A\* relative to extragalactic radio sources**

*T. Fukushima et al.  
NAO, Japan*

When we measure the position of Sgr A\* with respect to nearby extragalactic radio sources such as J1745-283 or J1748-291, some nuclear bulge stars might cause gravitational deflections that will affect the apparent positions of extra galactic sources. We estimate the effect on position and find that such effects may degrade the measurement of trigonometric parallax of Sgr A\*. To separate this gravitational deflection from annual parallactic motion, several years of continuous observation is needed. Such observation also tell us the density and the mass function of nuclear bulge stars. (Co-authors: *M. Hosokawa/CRL, Jpn., K. Ohnishi/NNCT, Jpn., D. Jauncey, J. Reynolds, A. Tzioumis/ATNF, Aus.*)

JD2.011 P

**Densification of ICRS in the Optical using Old Observation Sets**

*Irina I. Kumkova et al.  
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Modern tasks of high precision astrometry demand optical coordinate systems including more faint stars than are available now in current conventional systems (HIPPARCOS). For this purpose it is suggested to use old photographic observations accumulated in the Pulkovo Observatory. Extensive observational data have been obtained at Pulkovo Observatory during the last century in the framework of several programs, e.g. Pulkovo Galaxy Plan, etc. Observations have been made at the Normal Astrograph from 1894 to the present. The data are investigated with the aim of extending the Hipparcos catalog to faint stars beyond 11th magnitude. All available observations are taken into account. A description of the material considered is given. The distribution of the selected plates over the celestial sphere is shown. Coordinates of faint stars in the HIPPARCOS system are calculated for selected areas. The accuracy of computed star coordinates is analyzed. Results of the investigation are presented.

JD2.012 P

**Preliminary Results of the Optical Positions of Extragalactic Radio Sources**

*Jin Wen-jing et al.  
Shanghai Astronomical Observatory, China*

The optical positions of 9 compact extragalactic radio sources have been determined by using the 1.56m, 1m and 60/90cm telescopes with CCDs in China and the Axial Meridian Circle at Nikolaev Astronomical Observatory since Jan. 1996 in a cooperative project between the two observatories. The instrumentation, observations and reduction are briefly described, and the preliminary results are presented. The comparison between the optical and radio positions for 9 sources is also given. More optical positions of radio sources are being processed. Co-authors: *Z. H. Yang, S. H. Wang/ Shanghai Astronomical Observatory, China, G. Pinigin, A. Shulga, N. Maigurova, Yu. Protsyuk/Nikolaev Astronomical Observatory, Ukraine*

JD2.013 P

**Systematic and zonal differences of the FK5 proper motions to Hipparcos**

*Tinggao Yang et al.  
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In an overall comparison between Hipparcos proper motions and the FK5, we have determined the time-dependent rotation between the two systems. The rotational vector thus obtained is not able to explain the precessional correction of the FK5 system observed by VLBI, lunar laser ranging, and ground-based optical instruments. Analyzing proper motions of the ACRS, the PPM (both are on the FK5 system), and Hipparcos, we have found large differences in proper motions both globally and locally. In order to clarify these deviations, we have further analyzed the magnitude and color equations for the proper motions. On the other hand, we have compared the SPM 2.0 and Hipparcos proper motions to examine the proper motion systems, which were realized with respect to the extragalactic sources. Co-author: *Zi Zhu/Shaanxi Astronomical Observatory, China.*

JD2.014 P

**Proper Motions of Some Thousands of Stars From 1.5 Century Observations, Decl. > 75 Deg.**

*Tel'nyuk-Adamchuk V. et al.  
Kyiv University Astronomical Observatory, Ukr.*

For many years we have been studying the polar region of the sky, and this paper is devoted to problems of the densification and maintenance of the Hipparcos system north of 75°. Fourteen meridian and photographic source catalogs, with epochs from 1855 to the 1990s, were compared with the Tycho-2 data. To put the source catalogs onto the Hipparcos frame, the systematic differences were obtained directly for each star using weighted averaging of individual differences in an appropriate circle centered at each star. As a result the positions and motions were deduced for stars north of 75°. The catalog comprises 16 and 60 per cent of the stars in common to the Hipparcos and ACT catalogs, respectively. (Co-authors: *O. Gregul, O. Molotaj*).

JD2.015 P

**Relativistic Astrometry: Toward an Accurate Determination of Gamma**

*R. Smart et al.  
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Rapidly evolving space science technologies allow us to carry out astrometric measurements from space with unprecedented precision. As a consequence, the Newtonian representation of the space-time reference frame has become simply inadequate to preserve the high quality of the data themselves. In this context, the introduction of a more suitable framework becomes necessary to take into account non-Newtonian effects, and possibly test the predictions of General Relativity. The accurate determination of the  $\gamma$  parameter, which appears in the PPN formalism, is fundamental for the comparison of alternative metric theories of gravity, and, ultimately, for a better understanding of the coupling between matter and space-time. While the astrometric mission HIPPARCOS was able to estimate deviations of  $\gamma$  from 1 of the order of  $\approx 10^{-3}$ , the astrometric mission GAIA, under study by ESA, has the potential to push this limit down to interesting levels, i.e.,  $< 10^{-5}$ . In this paper, with the use of a realistic end-to-end simulation, we investigate the impact of a GAIA-like mission on the determination of such a fundamental relativistic parameter. Co-Authors: *B. Bucciarelli, A. Vecchiato, M. Crosta, F. de Felice, M. Gai, M. Lattanzi.*