

## GROUND – BASED LATITUDE DATA AND THE IMPROVED REFERENCE FRAME

GORAN DAMLJANOVIĆ<sup>1</sup> and NADA PEJOVIĆ<sup>2</sup>

<sup>1</sup>*Astronomical Observatory, Volgina 7, 11160 Belgrade 74, Serbia and Montenegro*  
*E-mail: gdamljanovic@aob.bg.ac.yu*

<sup>2</sup>*Dept. of Astronomy, Faculty of Mathematics, University of Belgrade,*  
*Studentski trg 16, 11000 Belgrade, Serbia and Montenegro*  
*E-mail: nada@matf.bg.ac.yu*

**Abstract.** The HIPPARCOS Catalogue is a product of the HIPPARCOS ESA astronomical satellite mission (ESA 1997). The observations lasted less than 4 years, and the epoch of the catalogue is 1991.25 (there are 118218 stars up to magnitude 12). The precision of positions is 1 *mas* and of proper motions is 1 *mas/year*. The HIPPARCOS Catalogue is the optical counterpart of the ICRF (International Celestial Reference Frame) and therefore the optical reference frame. Nowadays, it is possible to check and to improve some HIPPARCOS data (and the reference frame) by using other observations, as for example a long series of groundbased optical observations of some HIPPARCOS stars. Here, we used the data of Photographic Zenith Tubes (PZT) as the part of the different Earth rotation programmes made during the last century (Vondrák et al., 1998). These observations lasted much longer than the HIPPARCOS ones, and because of that we can give better proper motions than HIPPARCOS ones. The main steps of calculation (Damljanović and Vondrák, 2005) are presented with the results (the proper motions in declination) for 202 stars observed at Richmond PZTs. Also, we demonstrated a good agreement between our results and the ARIHIP ones, specially for the stars with a few decades of PZT observations.

**Acknowledgements.** Goran Damljanović performed his work as a part of the Project No 146022 "History and Epistemology of Natural Sciences" supported by the Ministry of Science and Environmental Protection of Republic of Serbia.

### References

- ESA: 1997, The Hipparcos and Tycho Catalogues, ESA SP-1200.  
Damljanović, G., Vondrák, J.: 2005, in the Proc.of the Journées 2004 Systèmes de Référence Spatio – Temporels, ed. N. Capitaine, Observatoire de Paris, 230.  
Vondrák, J., Pešek, I., Ron, C., Čepék, A.: 1998, Earth orientation parameters 1899.7 – 1992.0 in the ICRS based on the HIPPARCOS reference frame, Astron. Inst. of the Academy of Sciences of the Czech R., Publ. No. 87.