According to a recommendation of the Astronomisches Rechen-Institut Heidelberg continual observations of the FK4 and FK4 SUP stars were made at Vienna Observatory during the past ten years. The used transit instrument (Askania AP 70, 1960) was lent from the University of Technology in Vienna. It was equipped in the usual way with an impersonal contact micrometer. The aperture of 3 inches allows to reach most of the FK4 SUP stars; but only determinations of the right ascensions are possible. We also used several additional instruments, for example quartz clocks combined with digital equipments for time recording, a time signal receiver and so on. Furthermore we could get a permanent wire to an atomic clock, property of the Geodetic Department in Vienna (Bundesamt für Eich-und Vermessungswesen). Extensive and continual instrumental investigations were necessary (1, 2).

The aim of the observations was to find the individual errors concerning the right ascensions of the supplementary stars. The FK4 catalogue was used as reference system; therefore each group contained about the same number of FK4 and FK4 SUP stars. For the determination of the quantities - clock error and azimuth angle - only FK4 stars were used; thus the observed transits of the FK4 SUP stars were improved. In order to avoid additional systematical errors the observations were made within narrow zones of 5 to 10 degrees and also the time interval inside a group was limited to 2 hours and a half.

So we got the following results:

No 1) A catalogue of about 500 stars was given to Heidelberg on punchcards. Each star was observed six times or more.

No 2) On the average the mean square error of a single observation $\sigma_{\cos \delta} = \pm 0.5 \text{mas}$. Indeed, this internal accuracy is
sufficient to find the corrections of the supplementary stars. In most cases corrections up to 40 milliseconds are needed, but there are a few supplementary stars with corrections up to 100 milliseconds and more. FK4 stars need either no corrections or small corrections.

No 3) Concerning the external accuracy there exists a good agreement in amount and sign between Washington and Vienna results. The private communications by Washington Observatory were a good help, especially at the beginning of our work.

References


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