

FUNDAMENTAL DATA FOR FK4/FK4SUP STARS

H. Jahreiss

Astronomisches Rechen-Institut, Heidelberg
Federal Republic of Germany

1. INTRODUCTION

The stars in the FK4- and FK4Sup-Catalogue are supplied with visual magnitudes and spectral types essentially on the basis of the Henry Draper Catalogue. There are several good arguments, to compile additional astrometric, photometric and spectroscopic data for these stars. Not only to detect astrometric effects, which can produce errors in the fundamental system, like magnitude equation, colour equation, and foreground shortening effect. For the last one distances and radial velocities have to be known. But also to study the kinematics of the FK4/FK4Sup stars, in profiting from their high precision in proper motion.

The hitherto existing compilations of astrophysical data restricted themselves on subsets of the FK4/FK4Sup stars or are out of date. Therefore a new compilation was started. The search for data was much facilitated by the CDS supplying us with the desired catalogues. Throughout this paper it is evident, that in the various observing-programs preference was given to the brighter stars. Since the 1987 FK4Sup stars are concentrated around $m_v = 6^m$, whereas half of the 1535 FK4 stars are brighter than $m_v = 5^m$, the astrophysical data were found to be more complete for FK4 stars than for FK4Sup stars.

2. TRIGONOMETRIC PARALLAXES

Modern observing programs for the determination of trigonometric parallaxes concentrate mainly on faint stars. Therefore the General Catalogue of Trigonometric Stellar Parallaxes and its Supplement (Jenkins 1952, 1963) remain still the main sources. Since 1963 parallaxes were measured for only 92 FK4 stars and 19 FK4Sup stars respectively. Up to date for altogether 1011 FK4 stars and 531 FK4Sup stars published parallaxes could be found. But, due to the large mean errors, we can state, that only 50% FK4 stars and 16% FK4Sup stars have usable trigonometric parallaxes. This situation cannot be improved unless HIPPARCOS will be launched in the mid eighties. So, in determining

distances for the FK4/FK4Sup stars, we are largely dependent on photometric and spectroscopic data.

3. PHOTOMETRY

In UBV-photometry relative recent compilations are available by means of the Geneva catalogues (Nicolet 1975, 1978; Mermilliod 1980). The same is valid for the Geneva-Photometry (Rufener 1980) and for the uvby β -Photometry (Hauck and Mermilliod 1980). The latter one was used by Davis Philip and Egret to estimate several astrophysical parameters ($M_v, \theta, \log g, [\text{Fe}/\text{H}]$). In addition Neckel, Klare and Sarcander published extinction data for early type stars. Altogether, the following photometric data are available,

UBV-Photometry	for	1485 FK4(97%)	and	1605 FK4Sup(81%)
Geneva-Photometry	for	1284 FK4(84%)	and	1188 FK4Sup(60%)
for early type stars				
uvby β -Photometry	for	778 FK4(93%)	and	804 FK4Sup(80%)
Estimated Parameters	for	685 FK4(82%)	and	718 FK4Sup(71%)
Extinction Data	for	623 FK4(74%)	and	406 FK4Sup(40%) stars.

Hereby, a lot of stars lacking UBV-photometry were measured in one or another photometric system.

4. MK SPECTRAL TYPES

The main sources for MK spectral types are the Catalogue of Selected Spectral Types in the MK System (Jaschek 1978), and the first two Volumes of the Michigan Catalogue of Two-Dimensional Spectral Types for the HD-stars (Houk and Cowley 1975, Houk 1978) containing all HD-stars south of $\delta = -40^\circ$. As result there are in the

Cat. of Selected MK-Types	1329 FK4	and	1037 FK4Sup stars,
Michigan Cat. only ($\delta \leq -40^\circ$)	31 FK4	and	304 FK4Sup stars,
other sources (mainly after 1976)	86 FK4	and	123 FK4Sup stars.

Therefore, 94% of the FK4 stars and 74% of the FK4Sup stars are supplied with MK-types. Even selected they are of very different quality.

5. RADIAL VELOCITIES

Two bibliographies comprise the determinations of radial velocities before 1977, Abt and Biggs (1972), and Barbier (1977). Up to now for 1464 FK4 stars (95%) and 1504 FK4Sup stars (76%) radial velocities are published, and a great deal of the remaining FK4/FK4Sup stars were put on running observing-programs. But, comparable to the MK-types, the data are of different accuracy, and to date a necessary renewal of Wilson's system in the General Catalogue of Stellar Radial Velocities

(1953) is not in sight.

6. CONCLUSION

The present results display an increasing amount of photometric and spectroscopic data for the brighter stars. 1461 FK4 stars (95%) and 1616 FK4Sup stars (81%) are in Hoffleit's Catalogue of Bright Stars. But, whilst for the trigonometric parallaxes a new system will be available in the near future, the lack of homogeneous spectroscopic data will continue.

REFERENCES

All the Catalogues quoted are in the list of available Catalogues at the CDS. For further references see
Jahreiss, H.: 1981, Bull. Inform. CDS 10, 13