

DATA FOR THE COMPILATION OF THE " THIRD CATALOGUE OF NEARBY STARS "

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In 1957 I have published a catalogue of 915 stars - single and multiple systems - nearer or apparently nearer than 20 parsecs. The 1969 edition was extended to 22.5 parsecs with 1328 objects. In the last decade new trigonometric parallax programs have yielded first results and their accuracy has been increased. In 1981 the number of stars with known parallaxes exceeding $0''.044$ is estimated close to 1700. Certainly, that are not yet thirty per cent of the stars really existing in this volume. But time seems to be ripe for a third edition which should be extended to 25 parsecs now.

Probably, this new catalogue would close a period of parallax determinations. In the near future we expect a remarkable increase in accuracy of trigonometric parallaxes as Harrington and Westerhout say (1981) "Nearby space may no longer include the region within 25 parsecs, but that within 250 parsecs".

The goal of our catalogue is on one hand the compilation of known data for investigations of various problems, on the other hand it is a documentation of still insufficient knowledge to stimulate further observations.

The columns give the characteristic data of the objects: position, motion, parallax, spectral type, photometry, and by all means an appendix with Notes to the members of the star list.

The size of the parallax of a star decides for or against its inclusion in the catalogue. The new General Catalogue of Trigonometric Parallaxes (GCTSP) in progress at Yale shall be the basis of the 3rd Catalogue of Nearby Stars. Certainly, also among the stars of this catalogue we shall not find a representative sample of the objects in the solar neighbourhood. Many trigonometric programs have preferred the stars with large proper motions. Such selection effects are reduced by inclusion of nearby objects with spectroscopic and/or photometric parallaxes which have been determined without knowledge of proper motions.

It is indispensable to give spectral types and photometry in the 3rd catalogue of nearby stars and it is desirable to give these quantities in a uniform system - if possible. MK types are available for the brighter stars - we shall take advantage of the compilations at the CDS. For fainter HD stars in southern declinations the catalogues by N. Houk will be used. But we have to consider possible differences between the MK type-luminosity relation based on objective prism classifications and those based on slit spectra. For the largest group in the solar neighbourhood, the faint red dwarf stars, two significant classification systems shall be used also for the 3rd edition: 1) Mount Wilson types found in the Radial Velocity Catalogue (Wilson, 1953) and in the well-known list by Joy and Abt (1974), and 2) the spectral types by Kuiper which are still scattered in the literature.

A few smaller lists of spectral types can be used for luminosity estimates, at least to detect suspected nearby objects. The utilization of all possible spectral type-luminosity relations for distance determinations means that besides all help by data centers we have to search the modern literature. Today we have various photometric systems whose magnitudes and colours make it possible to derive photometric parallaxes. In the columns of the new catalogue we shall give broad-band UB_V, RI. These data are the only parameters which are fairly complete and homogeneous for the catalogue stars. Most of these data we shall receive from the CDS, mainly collected by the colleagues at Geneve. Distances based on other systems as Geneve, Strömgren will be taken into consideration too. For degenerates we intend to incorporate also Greenstein's photometric parallaxes.

For many objects various distance determinations will be available but users of the catalogue would like to find the most reliable parallax value for each star: one "resulting parallax" on which are based the luminosity M_V and the space velocity components of this object. It is one of the great difficulties in the compilation of such a catalogue to find the most reliable value out of various series of observations - should we use computed weighted means or should we give priorities ?

Furthermore, our work would be facilitated by a compilation of all the spectral type-luminosity relations and colour-luminosity relations scattered in the literature which can be applied for distance determinations of nearby stars. The various spectroscopic and photometric M_V are certainly not independent from each other. Their apparently best value has to be combined with the trigonometric M_V - this procedure is the other great difficulty when preparing the nearby star catalogue.

Besides these real problems the compilation of the positions and the proper motions makes no serious difficulties, except for a few faint objects. But unfortunately no complete up-to-date catalogue of the radial velocities is available.

A catalogue of nearby stars will be incomplete if it is not supplemented by detailed "Notes" informing on duplicity, on multiple systems,

on common proper motion pairs, on variability, on other peculiarities, or even on very discordant observational data for the various objects. This compilation will be facilitated by the data centers. But also continuous examination of current publications is necessary, a work which gets beyond one person. The third edition of the catalogue of nearby stars will be compiled by Gliese and Jahreiss; M. Petit will contribute the data of observed variability.

I close this report with thanks to all colleagues who have supported our work and who will do it in future.

REFERENCES

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