

30. COMMISSION DES VITESSES RADIALES

Report of meeting, 25 August 1967

PRESIDENT: D. S. Evans.

ACTING SECRETARY: R. F. Griffin.

Dr D. S. Evans, the Acting President, paid tribute to the late President, Dr R. M. Petrie. The text of the draft report with typographical corrections was accepted, and the composition of the Commission discussed.

Dr R. F. Griffin—Radial Velocities by the photoelectric method. A description of the radial velocity spectrometer used at the coudé focus of the Cambridge 36-inch telescope has been published.

In reply to questions by Fehrenbach, MacRae and Fletcher, *Griffin* expressed preference for the use of reference stars over an iron arc. He stated that the observation rate was 7 ± 1 stars per hour at all magnitudes and that the radial velocity diaphragm had a proportional transparency of 11.3 %.

Dr G. de Vaucouleurs—Scanning methods. At the Toronto symposium in June 1966, an experimental two-channel pulse counting spectrum scanner using a tuneable interference filter to measure radial velocities of extended sources was described (McDonald Obs. Preprint No. 2). Further development of the system and examples of applications to emission regions in nearby galaxies (M 33, M 101) were presented.

Mrs V. Rubin—Applications of Image Tubes. An image tube spectrograph designed at the Department of Terrestrial Magnetism has been used by myself and W. Kent Ford Jr. to obtain plates for determination of accurate radial velocities.

de Vaucouleurs. There is image-tube work in progress at Flagstaff and at McDonald, so it should soon be possible to compare image-tube velocities. We have observed NGC 4038 with the McDonald scanner.

Mrs Penston—A0 stars in the Galactic Caps. The aim of this Herstmonceux investigation is to determine whether the velocity dispersion increases with height above the galactic plane. If the dispersions are in the ratios of those found by Alexander the value of σ_w is found to increase with height from about 9 ± 1 km/s below 200 parsecs to about 18 ± 3 at about 500 parsecs.

Eelsalu. You selected a group of stars of type A0 from the Henry Draper Catalogue and then classified them on the MK system?

Mrs Penston. Yes. Of the 64 stars we observed, we found 15 Am stars, 20 A0 V and the rest scattered between B8 and A5.

Eelsalu. The HD types have systematic errors which are dependent on magnitude, so the sample of HD type A0 stars will also be magnitude-dependent.

MacRae. Are these the actual velocity dispersions of the stars or do they include the errors of observation?

Mrs Penston. They do not include observational errors.

MacRae. How great were those?

Mrs Penston. About 5 km/s for the mean of three plates.

Fehrenbach. Observations at Haute Provence tend to support the suggestion that the velocity dispersion increases with height above the galactic plane.

Dr F. K. Edmondson—Solar Motion from 11th magnitude A-stars. The result for the solar motion indicates that the 11th magnitude A-stars are moving toward the central region of the galaxy ($l_0^{11} = 335^\circ$) with a velocity of 14 ± 3 km/s relative to the naked-eye A-stars.

An analysis of *UBV* photoelectric measures of 50 stars by Young leads to a mean distance of 640 parsecs for this sample. The galactic rotation effect is small and not well determined ($rA = 3.5 \pm 2$ km/sec).

Feast. Thackeray has been working on southern B8 stars up to about 600 pc distance and has got indications of galactic rotation. Are the corrections you apply from your standards 'night corrections' or do they apply to the whole programme?

Edmondson. They apply to individual observing runs.

Dr D. A. MacRae—Proposal by Heard for 9th magnitude standard stars. At IAU Symposium No. 30 on Radial Velocities it was agreed that a set of standard-velocity stars, of magnitude 9 or thereabouts, was desirable. It was proposed that observatories engaged in radial-velocity determinations with slit spectrographs should select candidates for such a list and, if necessary, observe them further to establish their velocities with greater accuracy.

At the David Dunlap Observatory we have chosen 24 stars of spectral types F, G and K in the declination zone $+ 25^\circ$ to $+ 30^\circ$ which appear to have fairly well-established constant velocities as determined by us from four or more 66 Å/mm and 33 Å/mm prism spectrograms (*Publ. D.D.O.* 2, No. 4, 107, 1956). New observations with the 40 Å/mm grating spectrograph will be made to give improved mean velocities from eight or more spectrograms for those stars which appear still to have constant velocities. Collaboration by other observatories is welcome and we are willing to observe standards proposed elsewhere.

Table 1

HD (or AG)	$\alpha(1950)$	$\delta(1950)$	Ptg mag	Spectral type	No. of plates	Weighted mean
4388	00 ^h 43 ^m .8	30°40'	8.80	K3 III	4	- 24.8 \pm 0.2
12029	01 55.8	29 08	8.96	K2 III	5	+ 40.0 \pm 0.3
14969	02 22.6	29 39	8.96	K3 III	4	- 27.8 \pm 0.3
23169	03 40.9	25 34	9.39	G2 V	4	+ 17.4 \pm 0.3
32963	05 04.8	26 16	8.36	G2 V	4	- 62.0 \pm 0.4
42397	06 08.5	25 01	8.68	G0 IV	4	+ 39.8 \pm 0.2
(AG 4044)	07 31.4	28 51	9.29	G0 IV	4	+ 0.6 \pm 0.5
65934	07 59.1	26 47	8.87	G8 III	4	+ 34.4 \pm 0.5
75935	08 50.9	27 06	9.35	G8 V	4	- 18.7 \pm 0.7
86801	09 58.7	28 48	9.48	G0 V	4	- 4.6 \pm 0.5
90861	10 27.1	28 50	8.36	K2 III	5	+ 39.8 \pm 0.4
102494	11 45.3	27 37	8.26	G8 IV	4	- 21.1 \pm 0.7
112299	12 53.0	26 01	9.19	F8 V	4	+ 3.6 \pm 0.4
122693	14 00.5	24 48	8.74	F8 V	4	+ 1.0 \pm 0.4
132737	14 57.7	27 21	9.03	K0 III	4	- 20.7 \pm 0.6
140913	15 43.1	28 37	8.81	G0 V	4	- 14.5 \pm 0.2
149803	16 33.9	29 51	8.90	F7 V	4	+ 1.2 \pm 0.7
160952	17 39.7	29 37	9.04	G8 III	4	+ 30.6 \pm 0.3
171232	18 30.6	25 27	8.66	G8 III	4	- 30.6 \pm 0.9
(AG 10133)	19 33.0	28 59	9.55	F7 V	4	- 37.0 \pm 0.4
194071	20 20.5	28 05	9.06	G8 III	4	- 12.8 \pm 0.3
204934	21 29.0	28 09	9.64	K1 III	4	+ 2.5 \pm 0.3
213947	22 32.3	26 20	8.93	K4 III	4	+ 20.0 \pm 0.4
223094	23 43.9	28 26	8.97	K5 III	4	+ 20.8 \pm 0.5

Reply to *Popper*. The velocities are on the system of the David Dunlap Observatory, which contributed about 25% of the velocities in the Wilson Catalogue, so that their relationship to any other system should be well defined.

Feast. Thackeray pleads that standards should be within 15° of the equator. Kitt Peak people should also be interested in this since they are going to observe from both northern and southern hemispheres. Thackeray points out that you can get different velocity systems by the use of different emulsions even in the same spectrograph.

Dr D.S. Evans—Southern Standards. We find that most reliable velocities of ninth magnitude southern stars have been observed only in the Cape programmes at the Radcliffe Observatory, that they are mainly of late type and of rather high southern declinations. Later type standards are of value in that they simultaneously check spectrographic stability and the system of wavelength standards. A choice of stars including more in low declinations and some earlier types, observed from several different places, would be desirable. For the present, the following list of 14 solar-type stars which have given good results, may be of interest to other observers.

Table 2

FDS No	HD	1950 R.A.	Dec.	V	$B-V$	$(U-B)_c$	Type	RV & PE	No. Plates
V 819	6655	01 ^h 03 ^m 7	− 72°49	8.04	+ 0.55	1.66	G3 IV–V	+ 15.5 ± 0.5	(4)
I 52	24331	03 48.9	− 42 43	8.59	+ 0.91		K2 V	+ 22.4 ± 0.5	(4)
IV 668	39194	05 45.1	− 70 11	8.09	+ 0.76	1.83	K0 V	+ 14.2 ± 0.4	(4)
V 880	− 43°2527	06 30.7	− 43 29	8.61	+ 1.15	2.18	K1 III	+ 13.1 ± 0.5	(4)
V 883	48381	06 39.9	− 33 25	8.48	+ 1.05	2.08	K0 IV	+ 39.5 ± 0.5	(4)
II 373	83443	09 35.3	− 43 03	8.21	+ 0.81		K0 V	+ 27.6 ± 0.5	(9)
V 904	83516	09 35.9	− 34 51	8.63	+ 0.97	1.98	G8 IV	+ 42.0 ± 0.5	(4)
II 386	101266	11 36.4	− 45 05	9.29	+ 0.65		G5 IV	+ 20.6 ± 0.5	(5)
II 396	111417	12 46.7	− 45 33	8.33	+ 1.41		K3 IV	− 16.0 ± 0.5	(5)
IV 723	120223	13 46.1	− 43 29	8.97	+ 0.97	1.96	G8 IV–V	− 24.1 ± 0.6	(5)
IV 759	176047	18 56.4	− 34 32	8.10	+ 0.96	2.04	K1 III	− 40.7 ± 0.5	(4)
IV 768	193231	20 17.8	− 54 58	8.39	+ 0.73	1.78	G8 V	− 29.1 ± 0.6	(5)
V 1053	196983	20 38.7	− 34 04	9.08	+ 1.18	2.23	K2 III	− 8.0 ± 0.6	(4)
IV 794	219509	23 14.2	− 67 11	8.69	+ 1.06	2.20	K5 V	+ 62.3 ± 0.5	(4)

(Nf component of wide binary)

Dr J. Dommanget—Orientation of the Orbits of Binaries. Although no significantly non-random distribution is found in either heliocentric or galactic latitude, there is a region centred near $l^{\text{II}} = 35^\circ$, $b^{\text{II}} = + 60^\circ$, towards which no orbital poles are directed.

Of nine binary systems within 10 pc of the Sun, eight (including the solar system) have orbital poles near $l^{\text{II}} = 100^\circ$, $b^{\text{II}} = - 15^\circ$, if the sense of rotation is disregarded; the exception is α Cen.

Dr D.S. Evans—Revision of the General Catalogue of Radial Velocities. I show a part of the manuscript of the revision of the Radial Velocity Catalogue, and also the layout of the notes and bibliography. Further parts will be produced over the next few months and submitted in the form of proof copies to a small number of astronomers who have undertaken to read them critically.