

COMMISSION 30: RADIAL VELOCITIES (VITESSES RADIALES)

Report of Meetings in New Delhi, November, 1985

President: A. G. Davis Philip

A. Business Meeting, November 20, 1985

1. New Members of the Commission

The names of the new members proposed for Commission 30 were listed on the overhead projector screen. They are;

M. Breger	University of Vienna
G. Burki	Geneva Observatory
R. Burnage	Haute Provence Observatory
B. Campbell	Dominion Astrophysical Obs.
B. W. Carney	Univ. of North Carolina
J. -M. Carquillat	OPMT, Toulouse
W. D. Cochran	University of Texas
B. J. Hrivnak	Valpariso University
T. H. Kadouri	Space & Astron. Res. Cntr., Iraq
R. D. McClure	Dominion Astrophysical Obs.
V. Popov	Pulkova Observatory
Y. Romanov	Odessa Observatory
Myron Smith	National Solar Observatory
K. Yoss	University of Illinois

These new members were confirmed by a unanimous vote of those present. J. Sahade has resigned from Commission 30.

2. Officers of the Commission

Concerning the Organizing Committee, M. Duflot, D. Hube and J. Sahade leave the committee. After some discussion A. Florsch and R. McClure were appointed as new members. For the period 1985 - 88 the Organizing Committee will consist of J. Andersen, A. Florsch, D. Latham, E. Maurice, M. Mayor, R. McClure and D. Philip.

J. Andersen becomes President and D. W. Latham was elected Vice President for the term 1985 - 88.

3. Commission Report

The commission report, as printed in Volume XIXa of the transactions, was not the correct, final version. Copies of the correct version were passed out to all members of Commission 30 that were present at the meeting and other copies were given to J. Andersen for mail distribution after the General Assembly. Griffin had noted that many of his papers were missed in the Bibliography which was constructed from the Astronomy and Astrophysics Abstracts and which appeared at the end of the commission report. Philip pointed out that this problem arose

because many of the Griffin papers were listed under spectroscopic binaries by Astronomy & Astrophysics Abstracts and therefore did not appear as entries under radial velocities.

#### 4. New Committee on Radial Velocity Standards

J. Andersen proposed that a committee be formed of those people who are working actively on the problem of establishing, new, accurate radial velocity standards. Andersen was appointed as chairman with members B. Campbell, D. W. Latham, M. Mayor and R. D. McClure. The main aim is to help in setting up a list of radial velocity standards with the required accuracy for the new techniques of measuring radial velocity. The goal is to achieve an accuracy of  $\pm 0.1$  km/s for the mean velocities of each standard star and for the absolute zero point of the whole system. It was agreed that the list of 34 stars selected by Mayor and Maurice (1985 in IAU Colloquium No. 88, Stellar Radial Velocities, A. G. D. Philip and D. W. Latham, eds., L. Davis Press, Schenectady, p. 229) should be observed intensively over the next few years, and that absolute calibrations of the zero point should be carried out compared to solar system objects. A provisional list will be presented to the General Assembly in Baltimore in 1988.

#### 5. Commission Support of Proposed Meetings

The commission voted to co-sponsor the following meetings:

The Second Conference on Faint Blue Stars (Tucson, Arizona, May 30 - June 3, 1987, D. Philip is Chairman of SOC).

Very High Signal/Noise Spectroscopy: A New Era for Stellar Physics (Paris, France - June, 1986, G. Cayrel is Chairman of SOC).

Circumstellar Matter in Close Binaries (Victoria, BC, Canada, June, 1987, A. Batten is Chairman of SOC).

#### 6. Report of Working Groups

Bibliographic Stellar Radial Velocities Catalogue. Barbier reported that this catalogue is complete up to 1980 and is to be published in an *Astron. Astrophys. Suppl.* It contains 11,350 references. The magnetic tape is available at the Marseille Observatory. The data have been sent in to the Strasbourg Data Center and are included in the SIMBAD data base. The data up to 1985 will be included by the end of 1986.

Mean Stellar Radial Velocity Catalogue. Barbier reported that the rules governing the inclusion of a velocity in the catalogue were defined at the XVII General Assembly in Patras. Last year at IAU Colloquium No. 88 in Schenectady she presented the mean radial velocities of about 100 stars, as an example, to show that the program is working well. At the present time the mean radial velocity catalogue is ready up to 1975, including stars at 21, 22 and 23 hours which were not included in Evan's Catalogue.

The commission 30 members, present at the meeting, expressed their thanks to Dr. Barbier for her great efforts in preparing these two catalogues.

#### B. Joint Meeting with Commissions 28, 30 and 40

Galaxy Redshift Surveys - November 20, 1985

The program for this meeting was as follows:

D. W. Latham	Redshift Surveys and the Large-Scale Structure of the Universe
R. Giovanelli	Radio Surveys
M. J. Geller	Optical Surveys
J. T. Huchra	
D. W. Latham	
V. DeLapparent	
L. A. N. DaCosta	Southern Surveys: An Overview
J. W. Menzies	Southern Surveys: The South African
I. M. Coulson	Astronomical Observatory Contributions
A. Fairall	Red Shifts from South Africa

The main thrust of the session was to review the latest efforts to extend redshift surveys of galaxies and clusters of galaxies and also to review the plans for the continuation of this work. The individual papers are being published in the Highlights of Astronomy, under the editorship of D. W. Latham. Latham chaired the joint meeting.

C. First Scientific MeetingProgress in Radial Velocity - November 22, 1985]

The program was as follows:

D. W. Latham	Review of IAU Colloquium No. 88, Stellar Radial Velocities
J. Andersen	Cross Correlation Velocities for
G. Hill	Early-Type Stars
M. Mayor	CORAVEL Results
D. W. Latham	Digital Speedometry
A. Florsch	Radial Velocity Projects in France
B. Carney	Halo Survey
R. Griffin	Recent Results

D. Second Scientific MeetingStandard Radial Velocity Stars - November 22, 1985

The program was as follows:

- |              |   |
|--------------|---|
| A. H. Batten | The Present Situation Concerning Radial Velocity Standards                                  |
| M. Mayor     | CORAVEL Measures of Radial Velocity Standards: The Absolute Zero Point of Radial Velocities |
| D. W. Latham | Digital Speedometry of Radial Velocity Standards  |

E. Joint Meeting of Commissions 29 and 30

Working Group on Standard Stars - November 26, 1985

The program was as follows:

- |   |   |
|---|---|
| D. Philip   | The Microfiche of Standard Stars  |
| H. Neckel   | The Absolute Energy Distributions of the Sun, of the Solar Analogs 16 CygB, 16 CygA, VB 64 and of the Standard Stars Alpha Lyrae and 29 Psc |
| G. Cayrel   | Remarks Concerning Solar Analogs  |
| M. L. Malagnini<br>C. Morossi<br>L. Rossi             | Does a Solar Twin Really Exist?   |
| I. N. Glushneva<br>E. A. Makarova<br>A. V. Kharitonov | Energy Distribution, Photometry and Physical Characteristics of the Sun and Star-Solar Analogs  |
| L. Rossi<br>A. Altamore<br>C. Rossi                   | A Study of the Solar Analogs in the Ultraviolet   |
| M. Fracassini<br>L. E. Pasinetti                      | Photometry of Comet Halley: Solar Analogs Selected Along the Path (November 1986 - May 1986)  |

F. Report by R. P. Stefanik, D. W. Latham and R. E. McCrosky concerning Measurements of Selected IAU Radial Velocity Standard Stars

The results for the 9 standard stars observed at CfA are presented in Table I. The Henry Draper Catalog number, 1950 right ascension and declination, apparent visual magnitude, mean velocity and RMS, number of exposures, difference between the maximum and minimum velocities for the star, and the interval in days between the first and most recent observation are shown. The mean RMS residual is about 0.5 km/s, and this is the precision that is expected for a single

measurement. Since there are roughly 20 observations per star, the mean velocities for these stars should be good to about 0.1 or 0.2 km/s, assuming that there are no serious systematic errors, an assumption which may not be valid.

TABLE I.

## Summary of CfA Velocity Measurements

HD	RA (1950)	Dec	$m_V$	<CfA>	RMS	N	Delta	Days
8779	01 23 53.6	-00 39 29	6.4	$-3.57 \pm 0.54$	22	2.42	1508	
26162	04 06 14.9	+19 28 43	5.5	$24.93 \pm 0.55$	23	2.07	1513	
66141	07 59 39.9	+02 28 24	4.4	$72.19 \pm 0.98$	13	4.06	1417	
89449	10 17 01.0	+19 43 31	4.8	$6.45 \pm 0.50$	16	1.39	1635	
92588	10 38 51.5	-01 28 42	6.3	$42.41 \pm 0.22$	5	0.59	1407	
114762	13 09 54.5	+17 46 55	7.3	$49.59 \pm 0.55$	23	2.07	1520	
136202	15 16 45.4	+01 57 12	5.1	$54.77 \pm 0.37$	17	1.47	1222	
182572	19 22 35.1	+11 50 10	5.2	$-100.18 \pm 0.46$	40	1.76	1522	
213014	22 25 45.8	+17 00 28	7.3	$-39.57 \pm 0.39$	35	1.59	1513	

In Table II the mean velocities for each of the nine stars are compared with the mean velocities reported for the CORAVELs (Mayor and Maurice 1985 in IAU Colloquium No. 88. Stellar Radial Velocities, A. G. D. Philip and D. W. Latham, eds., L. Davis Press, Schenectady, p. 299) and for the Victoria spectrometer (Fletcher, J., Harris, H., McClure, R. and Scarfe, C. 1982 Publ. Astron. Soc. Pacific 94, 1017).

TABLE II

## Comparison of CfA with CORAVEL and Victoria

HD	CfA-COR	CfA-Vic	COR-Vic	Comment
8779	1.11	1.23	0.12	Suspected Variable
26162	0.60	0.11	-0.49	Suspected Variable
66141	1.00	0.45	-0.55	
89449	0.50	0.22	-0.28	Suspected Variable
92588	0.13	-0.38	-0.51	Few CfA observations
114762	0.43	-0.01	-0.44	
136202	0.39	0.26	-0.13	
182572	0.34	0.11	-0.23	
213014	0.80	0.15	-0.65	

In the comparison of the zero points of these three velocity systems, HD

8779 was eliminated because the differences from one system to the next are large. The differences between the velocity systems are found

$$V(\text{CfA}) - V(\text{COR}) = 0.52 \pm 0.27 \text{ km/s}$$

$$V(\text{CfA}) - V(\text{Vic}) = 0.11 \pm 0.24 \text{ km/s}$$

where the error is the RMS of the differences for individual stars. These errors are encouragingly small. For example, if we assume that all three systems have about the same error for the determination of the mean velocity of an individual IAU standard, then this error must be less than about 0.2 km/s for the eight stars included in the above comparison. If the eight stars are not affected by systematic effects such as slow velocity variations with time, then the error one might expect for the comparison of the mean zero points should be root eight smaller, or something like 0.1 km/s. These errors suggest that it should be possible to determine the velocity zero point of a selected subset of IAU standards to an accuracy of 0.1 km/s, but only if the systematic errors can be controlled.

G. Continuation of the Bibliography of Radial Velocity Papers from A & A Abstracts, Volumes 38 and 39

In the appendix of IAU Colloquium No. 88, Stellar Radial Velocities, there is a bibliography of radial velocity papers taken from volumes 30 -34 and 37 of Astronomy and Astrophysics Abstracts. Since the proceedings of this meeting were published, two additional volumes of the abstracts have appeared, Volumes 38 and 39. The abstract numbers of the additional papers are listed below, segregated by topic.

Topic	Abstract Numbers		
Associations, OB	39.152007	39.157008	
Bibliography	39.002100		
CCD Detectors	39.036188		
CLusters, Globular	38.154029	38.154049	38.154078
	39.154045	39.154051	39.154076
	39.154077	39.154088	
CLusters, Hyades	38.153002	39.153051	
Clusters, Open	38.153043	39.152007	39.153034
	39.153051		
Data Processing	39.111008		
Galaxies	38.157048	38.157150	38.157205
	39.002095	39.036072	39.036073
	39.157130	39.157213	
Galaxies, Clusters of	38.160016	39.160064	39.160141
	39.160144		
Galaxies, Elliptical	39.157159		
Galaxies, Magellanic Clouds	39.156026	39.156034	
Galaxies, Markarian	38.158050		
Galaxies, Spiral	39.157058		
H II Regions	39.132017		
Methods of Observation	38.036117	39.034123	39.034125
	39.034126	39.034127	39.036072
	39.036118	39.036184	39.036185
	39.036187	39.036188	39.036189

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Topic	Abstract Numbers		
	39.036191	39.111010	
Nebulae, Planetary	39.134012	39.134040	
Solar Atmosphere	38.036141		
Solar Corona	38.074001		
Solar Radio Bursts	39.077018		
Spectra, Stellar	39.036117	39.064088	
Spectrometers	39.034084		
Stars	38.111020	38.111021	39.002077
	39.111099		
Stars, A	39.111004		
Stars, AM Her	39.117385		
Stars, AM	39.120034		
Stars, Barium	39.111030	39.111036	
Stars, Be	38.112028	39.112100	
Stars, Beta Cephei	39.122123		
Stars, Binaries, Cataclysmic	39.117331	39.117386	
Stars, Binaries, Close	38.117080	38.120017	39.117251
Stars, Binaries, Contact	39.117060	39.117142	
Stars, Binaries, Eclipsing	38.119082	38.119087	38.120018
	39.119007	39.119042	39.119098
	39.119106	39.119110	
Stars, Binaries, Semi-Detached	38.117206	38.120001	38.120002
Stars, Binaries, Spectroscopic	38.120019	38.120022	38.120023
	39.013060	39.036186	39.111002
	39.120002	39.120006	39.120011
	39.120024	39.120025	39.120032
	39.120044		
Stars, Binaries, X-Ray	38.119095	39.117200	39.117384
Stars, Blue Stragglers	38.153029		
Stars, Bright	38.111024	39.111002	
Stars, Carbon	39.111012		
Stars, Catalogues	38.002019	38.002035	39.002098
	39.111023		
Stars, Cepheids	38.122093	39.122039	39.122187
Stars, Cepheids, Dwarf	39.122184		
Stars, Cool	39.111026		
Stars, Delta Scuti	38.123107		
Stars, F Dwarfs	39.155153		
Stars, F Supergiants	38.114058		
Stars, Fundamental	39.041022		
Stars, Giants, Late-Type	39.111039	39.111041	
Stars, Giants, Pop II	39.155100		
Stars, Halo	39.111004	39.111046	39.120035
	39.120036		
Stars, Hg-Mn	38.120001		
Stars, High-Velocity	38.111009		
Stars, Horizontal-Branch	39.111001		
Stars, K Giants	38.155048	38.155049	
Stars, Late Type	38.111024	38.114057	39.111002
	39.114008	39.114099	
Stars, Magnetic	38.118029		
Stars, Mira	38.122079		
Stars, Nearby	39.111024	39.120018	

Topic	Abstract Numbers		
Stars, Novae	39.124228		
Stars, Novae, Dwarf	39.117202		
Stars, OB	39.111022		
Stars, Peculiar	39.111008		
Stars, Pop II	39.111032		
Stars, Pre Main-Sequence	39.121004		
Stars, Proper Motion	39.111036		
Stars, RR Lyrae	39.122188		
Stars, RS CVn	39.117141		
Stars, Red Giants	39.155154		
Stars, SU UMa	38.117176		
Stars, Standard	38.111003	39.111040	39.111042
	39.111043	39.111044	
Stars, Subdwarfs	38.111004	38.126062	39.117157
Stars, Sun	39.036208		
Stars, Supergiants, Late-Type	39.111038		
Stars, Symbiotic	38.117248	39.117279	
Stars, Variable, Late-Type	38.122090		
Stars, Variable, Nova-Like	39.117202		
Stars, Variable, Semiregular	38.111013		
Stars, W UMa	38.117228	39.117280	39.119009
Stars, White Dwarfs	39.117330		
Stars, Wolf-Rayet	38.111026	38.114052	
Surveys	39.111034	39.111035	39.111037
	39.111045		
X-Ray Sources	38.119095	38.142047	