

# COMMISSION 40: RADIO ASTRONOMY (RADIO ASTRONOMIE)

Report of Meetings, 21 and 29 August 1973

PRESIDENT: D. S. Heesch.

SECRETARY: W. E. Howard.

## Business Meetings

The following matters were discussed at the two business meetings of Commission 40:

### 1. THE REPORT OF THE COMMISSION

Opinions were divided concerning the scientific value of Commission Reports in *Transactions*, relative to the cost to produce and distribute it. Many members were of the opinion that the size limit imposed by the Executive Committee restricted the Report to a bibliography of only limited usefulness. Others felt that summaries, even if brief, are valuable. There was no clear consensus that Commission 40's recent practice should be changed.

### 2. MEMBERSHIP

A subcommittee consisting of R. D. Davies (chairman) and W. E. Howard received and reviewed nominations for membership. Thirty-five new members were elected by the Commission.

### 3. COORDINATION OF FLUX DENSITY CALIBRATIONS OF STANDARD SOURCES

The Working Group set up at Brighton, Shakeshaft and Kellermann, has undertaken an analysis of the flux density scales in various catalogues as a function of the observing frequency. The results on scale corrections and a list of secondary calibrators will be published shortly. The Working Group is being continued.

### 4. FUNDAMENTAL POSITIONAL SYSTEMS FOR RADIO ASTRONOMY

A working Group consisting of Ryle (convener), Burke, Christiansen, Cohen, Gent, H. Palmer and Raimond has suggested that a group of 21 radio sources be used as fundamental calibration sources for positions. Desirable characteristics of this group include: (1) appreciable flux density, (2) well distributed in the sky, (3) relatively flat spectra, (4) small diameter, and (5) no low frequency cut-off. In addition, a larger number of sources is suggested as secondary calibrators. These sources may be found in the following references:

#### *Fundamental Calibrators*

Ryle, M. *et al.*: 1973, *Monthly Notices Roy. Astron. Soc.*, in press.

Tucker, R. *et al.*: 1973, *Monthly Notices Roy. Astron. Soc.*, in press.

#### *Secondary Calibrators*

Adgie, R. *et al.*: 1972, *Monthly Notices Roy. Astron. Soc.* **159**, 233.

Browne, W. *et al.*: 1973, *Nature* **244**, 146.

Hunstead, R.: 1972, *Monthly Notices Roy. Astron. Soc.* **157**, 367.

Brosche, P. *et al.*: 1973, *Astrophys. J.* **183**, 803.

Kapahi, V. *et al.*: 1973, *Astron. J.*, in press.

Swarup, G. *et al.*: 1971, *Astrophys. Letters* **9**, 53.

Joshi, M. *et al.*: 1973, *Astron. J.*, in press.

The Working Group pointed out that calibration sources are still needed for the southern hemisphere.

The report was adopted and the Working Group dissolved.

#### 5. THE UNIT OF FLUX DENSITY

*Kerr* proposed the following resolution that was passed by the Commission: 'RESOLVED, that the name 'Jansky', abbreviated 'Jy', be adopted as the unit of flux density in radio astronomy and that this unit, equal to  $10^{-26} \text{ W m}^{-2} \text{ Hz}^{-1}$ , be incorporated into the international system of physical units.'

#### 6. STANDARD EQUINOX FOR ASTRONOMICAL CATALOGUES

*Bolton* proposed the following resolution that was passed by the Commission, after discussions with Commission 8: 'RESOLVED, that the equinox of 1950.0 should remain the standard equinox for astronomical catalogues.'

#### 7. OPTICAL AND RADIO DEFINITIONS OF RADIO VELOCITY

Optical astronomers have customarily defined radial velocity as  $cz = c\Delta\lambda/\lambda_0$ . Radio astronomers usually express radial velocity as  $c\Delta f/f_0$ . For vacuum ultraviolet lines redshifted into the visual, some spectroscopists have quoted a  $z = (\lambda_{\text{air}} - \lambda_{0, \text{vac}})/\lambda_{0, \text{vac}}$ . Differences between these various definitions become appreciable for velocities above  $1000 \text{ km s}^{-1}$ . A joint working group convened by Commission 30 and involving Commission 40 members M. Roberts and B. Clark will be established to attempt to unify the definitions.

#### 8. POLARIZATION DEFINITIONS

A working Group chaired by *Westerhout* was convened to discuss the definition of polarization brightness temperatures used in the description of polarized extended objects and the galactic background. The following resolution was adopted by Commissions 25 and 40: 'RESOLVED, that the frame of reference for the Stokes parameters is that of Right Ascension and Declination with the position angle of electric-vector maximum,  $\theta$ , starting from North and increasing through East. Elliptical polarization is defined in conformity with the definitions of the Institute of Electrical and Electronics Engineers (IEEE Standard 211, 1969). This means that the polarization of incoming radiation, for which the position angle,  $\theta$ , of the electric vector, measured at a fixed point in space, increases with time, is described as right-handed and positive.'

#### 9. NEWSLETTER ON UNIDENTIFIED MOLECULAR LINES OR NEGATIVE SEARCHES

*D. Johnson* and *B. Donn* proposed a means for reporting and documenting new unidentified radio lines and negative-result searches for molecular lines. Forms with a tentative format were presented that will be sent to active observers who can summarize past and future line search results. These summaries will be circulated among the observers or published occasionally in the existing literature.

#### 10. INTERFERENCE AND FREQUENCY ALLOCATIONS

*F. G. Smith* summarized the worldwide status of frequency allocations for the radio astronomy service that resulted from the World Administrative Radio Conference (WARC) in 1971, and

presented the new system of correspondents now in use by the Inter-Union Commission for the Allocation of Frequencies for Radio Astronomy and Space Science (IUCAF). Smith asked for advice on whether allocated frequencies in the range 10–15 MHz would be desirable and asked for advice on priorities for future protection for newly discovered molecular lines. Howard summarized the broadcast satellite problem at the 2690 MHz band edge, noting that the satellite, expected to become operational in 1974, will now contain a filter that should reduce interference to below the levels recommended for the 11-cm radio astronomy band by Report 224 of the CCIR.

#### 11. RESEARCH PRIORITIES

The Commission went on record as opposing any suggestion to attach priorities to research programs in radio astronomy.

#### 12. OTHER RESOLUTIONS

Commission 40 endorsed the resolutions passed at the *IAU Symposium 61* in Perth concerned with astrometry.

#### 13. ELECTION OF THE ORGANIZING COMMITTEE

The President presented the following list of nominations for Officers and Organizing Committee of the Commission which was approved without further nominations:

President: Yu. N. Parijskij

Vice President: H. van der Laan

Organizing Committee: Blum, Heeschen, Kuzmin, McLean, Menon, Mezger, H. Palmer, Robinson, Zuckerman.

#### Scientific Meetings

A Joint Discussion on Very Short Time Scale Phenomena was held on August 28, organized by F. G. Smith and is described in *Highlights of Astronomy 3*.

The Commission participated in the following joint scientific meetings, with the other Commissions indicated: *Galactic Spiral Structure* (33, 34, 40), *X-Ray Sources, Black Holes and Radio Stars in Binary Systems* (27, 35, 40, 42, 44, 48), *Solar Work* (10, 40, 44), *Molecular Radio Astronomy* (14, 40), *Very Compact H II Regions* (25, 27, 34, 37, 40), and the *Definition of the Meter* (4, 14, 31, 40).

One scientific session devoted to extragalactic radio astronomy was held on August 28, organized by Shakeshaft.