

**GENERAL DISCUSSION,
SUMMARY AND RESOLUTIONS**

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Elsmore: Further to the brief discussion we have already had, I wonder what advice you would give to the radio astronomers as to the best choice concerning the zero point of right ascension. Should radio astronomers strive to establish the equinox fundamentally, or is it sufficient to use an FK4–FK5 star or an extragalactic object, or is it better to adopt a mean from several stars or from several extragalactic objects?

Dieckvoss: I would suggest a few radio sources with optical counterparts.

Tucker: It may be preferable for the radio astrometrists to define their position zero in terms of a galactic rather than equatorial co-ordinate system. This would avoid the anomaly of setting up a precessing radio co-ordinate system when a non-precessing system is available, constituted by a source catalogue giving determined (l, b) . Transformation from (l, b) to $(\alpha_{1950}, \delta_{1950})$ will then be by the rigorous definitions adopted by the IAU in 1959.

Dieckvoss: We should not forget that the radio measurements of R.A. differences and Declinations are made with antennae fixed to the rotating Earth.

Kovalevsky: The radio astronomers should build their own reference system independently of the classical definitions (reference to FK5) and observe links with stars and with the solar system as much as they can in order, when possible, to have observations permitting a link with the ecliptic and equator. But they should not try to define their system as optical people do (equinox, etc.) if we do not want to introduce difficulties and misunderstandings.

Eichhorn: Since right ascension and declination are basically determined by the kinematics of the Earth and completely extrinsic to the stellar system there is little merit in choosing this co-ordinate system exclusively as the basis for positions observed by radio means.

Gubbay: I think we may be approaching a philosophical limit in that as we approach position accuracies of 0'001 the objects we see are likely to suffer increasing variations in flux density and in position.

It seems advisable to adopt a group of reference sources which are extragalactic, are visible with VLBI at microwave frequencies and have optical counterparts proper, and to review this catalogue as experience grows in radio astrometry.

Wall: I want to raise a point in connection with radio astrometry. For several years at Parkes we have been carrying out a 2700 MHz survey for extragalactic radio sources, with the finding of compact sources as a principal objective. Several hundred such sources now appear in the Parkes catalogues, and some 300 have been identified with quasi-stellar objects. Thus in the sense that the sources for radio astrometry in the southern hemisphere are known, we are perhaps more fortunate than our northern hemisphere colleagues. However, the instrumentation for accurate measurement of

the positions is lacking and the support of all members of this symposium is solicited in order to obtain it.

Matsunami: When we take into account the effects of tropospheric and ionospheric scintillation and of diurnal variation of electron density of the ionosphere, we propose an interferometer which has a baseline of about 100 km and is to be operated with a frequency of about 5 or 6 GHz and has a phase lock system by two way radio link. Significance is just the same as Dr Elsmore's work. The problem is the cost of construction and of maintenance. If we could achieve this, we may get an accuracy of less than 1 ms (in time) for radio sources at $\delta=0^\circ$.

Van Herk: Statisticians complain that astrometrists are not handing down results in the way a statistician would like it: the compiler of a catalogue gives a result which is a modification of the original observations.

The statistician cannot apply proper statistical methods to this material. It is suggested that the individual observations, together with relevant auxiliary data – as far as we can know them – are kept available. Publishing individual data is of course, out of the question.

Eichhorn: It would give future investigators the full benefit of results of past statistical adjustments if not only the unknowns and their standard errors were published, but also the covariance matrix of these quantities. This would not require too much space and – from the standpoint of statistics – be virtually equivalent to communicating – in printing – all the original observations.

Klock: I can sympathise with Dr van Herk's request but in the case of a typical observing programme where an FK4 star may be observed 80–100 times, it would be impossible to publish particulars of each observation. Generally at the U.S. Naval Observatory we retain this more detailed data at least 10 years after the catalogue is published.

In recognition of their distinguished service to international projects in fundamental astrometry, telegrams of greeting were sent on behalf of the participants to Mr F. P. Scott, formerly of USNO, and Prof. M. S. Zverev, of Pulkovo.