

## REFRACTION IN RADIOASTRONOMY

Wilhelm J. Altenhoff  
Max-Planck-Institut für Radioastronomie  
Auf dem Hügel 69  
5300 Bonn, West Germany

### ABSTRACT

In the last few years there was no paper in the astronomical literature reporting on new measurements of radioastronomical refraction. But there are some important review papers on different aspects of this topic, e.g. on the ionosphere by M.M. Komesaroff (1960) and T. Hagfors (1976), on the prediction of tropospheric refraction with ground based meteorological data by B.R. Bean (1962), B.R. Bean and G. Teleki (1974), and R.K. Crane (1976), on range measurements, predicted again by surface weather data, by H.S. Hopfield (1971).

For astrometry only interferometric observations give the necessary positional accuracy. The result of the interferometer is not affected, if the delay by the atmosphere is the same for each antenna, therefore this technique is not sensitive to normal refraction.

Differential delays can originate in the uneven distribution of water vapor in the atmosphere. Wesseling et al (1974) measured these differential delays with an infrared hygrometer; their attempts to correlate the water vapor with the observed interferometer phase were only partially successful.

Hinder (1970) has investigated the differential delays as function of baseline and of season. One can conclude that improvements of positional accuracy either by going to longer baselines or to shorter wavelengths depend on the success to predict the differential delays either by infrared hygrometers or similar means.

### REFERENCES

- Bean, B.R.: 1962, Proc. I.R.E., 50, 260.
- Bean, B.R., Teleki, G.: 1974, in Publ. Obs. Astron. Belgrade, Vol. 18, edited by G. Teleki.

Crane, R.K.: 1976, in *Methods of Experimental Physics*, Vol. 12B, edited by M.L. Meeks, New York.

Hagfors, T.: 1974, in *Methods of Experimental Physics*, Vol. 12B, edited by M.L. Meeks, New York.

Hinder, R.A.: 1970, *Nature*, 225, 614.

Hopfield, H.S.: 1971, *Radioscience*, 6, 357.

Komesaroff, M.M.: 1960, *Australian J. Phys.*, 13, 153.

Wesseling, K.H., Basart, J.P., Nance, J.L.: 1974, *Radioscience*, 9, 349.