For the krypton–xenon system, w_{AB}/kT has the value 1·3 according to the crude theory at about 113° K. If we assume that the mixtures obey a law of corresponding states, the data for the argon–krypton system indicate that the critical temperature of this solution would be 62° K.

A further analysis of these and other data will appear elsewhere.

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Interferometric Spectroscopy in the Far Infra-red

Resolving power in the far infra-red region of the spectrum is limited in dispersion spectrometers by the small amounts of power available for measurement. The procedures for isolating unwanted orders with grating instruments and for discrimination against stray light not only reduce further the available power but also require elaborate instruments. We find an attractive alternative for this spectral region in interferometric spectroscopy, and this communication gives some pertinent experimental results.

Fig. 1 shows the response of a thermal detector to the resultant intensity from two interfering beams when the optical path-difference between them is changed. The reflexion interferometer used was 7·5 cm. in diameter and the maximum path-difference between beams was 7 mm. The spectral information contained in one half of Fig. 1 is displayed explicitly by its Fourier transform in Fig. 2. This transform was obtained by numerical analysis using a high-speed digital computer. The particular spectrum is of the radiation from a globar radiation source after reflexion from two cæsium bromide crystal surfaces and modified by the pure rotation absorption spectrum of water vapour. For comparison, a representation of the calculated rotation spectrum of the water molecule is given alongside.

The resolution shown here was arbitrarily restricted by the numerical analysis and does not represent the limit imposed by the maximum path-difference between beams. Since only reflecting elements are used in the optical system of the interferometer, the interferogram is symmetrical about the point of zero path-difference. This permits its representation by a Fourier integral containing only cosine terms.

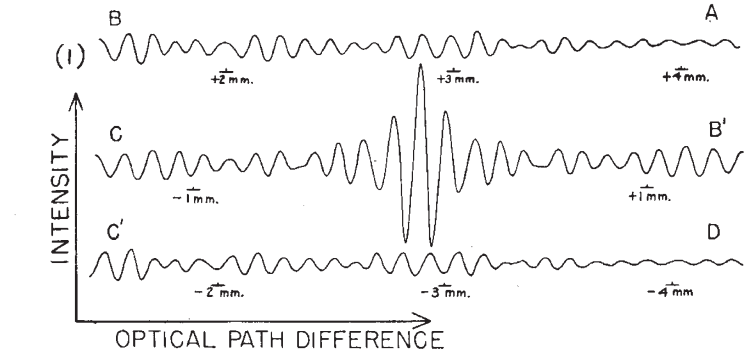

Fig. 1. Curve *ABB'CC'D*. Resultant intensity of two interfering beams as path-difference changes continuously

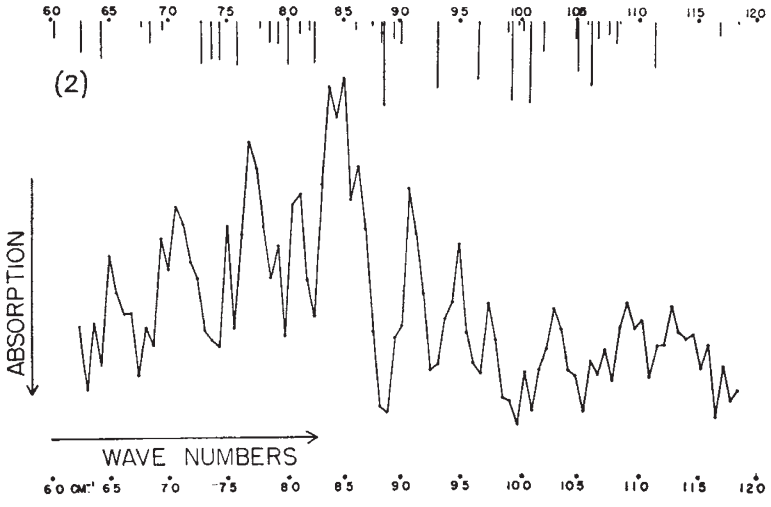

Fig. 2. Far infra-red reflexion spectrum of two cæsium bromide crystal faces modified by absorption spectrum of residual water vapour, with calculated water spectrum represented above

An additional significance of these results, for a region of the electromagnetic spectrum which has not been extensively studied, lies in the fact that the interferometer is readily adaptable to large construction to obtain greater light-grasp and resolving power.

A larger instrument with aperture 30 cm. has been made for study of atmospheric transmission in the submillimetre wave region.

We would like to thank various members, and Mr. G. M. Benson in particular, of the International Business Machines Corporation, Scientific Computation Laboratory, Endicott, New York, for their collaboration in applying digital methods to this problem. This investigation was sponsored by Air Force Contract *AF*18(600)-1307.

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