55. Interferometric Constant Deviation Prism.

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The instrument was designed for examining the structure of spectral lines without the use of a monochromator, and for crossing the spectra obtained with Fabry-Perot interferometer with those from Lummer-Gehrcke plate or echelon grating. In crossing the spectra, the loss of light by the introduction of a system of lenses is considerably great, so that the structure of faint lines is often left unknown. By the use of the present instrument, this inconvenience is much avoided, as the monochrometer is dispensed with.

The construction is evident from the figure. Ordinary constant deviation prism is divided into two parts, ABC and DEF; the latter subtends a refracting angle of 30°. The ray of light, as shown by the dotted line, passes the interspace ACFD at right angles to the opposite faces when the incident and the refracted rays are at right angles, i.e. for minimum deviation. The lines to be examined should be so dis-
posed. Three legs of silica glass of equal lengths, or S.K.F. balls, ground down to cylinders, leaving the small portion of the spherical surface, separate the two faces, which are silvered by cathode sputtering. Thus the interspace takes the place of an air plate in Fabry-Perot interferometer. The spectral lines, as observed through the prism, all show circular fringes, of which the line at minimum deviation is exactly centered. Thus the prism serves as an interferometer for different lines without a monochromator.

By bringing in a Lummer-Gehrcke plate or an echelon grating in front or behind the prism in proper position, the fringes are interposed, and we obtain the crossed spectra, which are more intense than in the ordinary process of crossing, as it can be done without a monochromator, the prism playing its part.

This point is of special importance in crossing with an echelon grating. The constant deviation prism in the Hilger type of the instrument can be substituted by the interferometric one, and the image of the rings obtained in the interferometer projected on to the slit of the echelon spectroscope without further addition of projecting apparatus, and thus brought directly into crossed spectra with the lines analysed by the echelon. By this means the study of the structure of lines is much facilitated, as the only procedure is to replace the ordinary constant deviation prism with the interferometric one. On account of the small loss of light, the photographic exposure is much shortened and the result thus rendered more trustworthy than with the methods formerly used.

The spectrograms of Hg lines obtained with the present instrument are given below.

![Fig 2.](image)

Exp. 3 m.  Exp. 20 sec.  Exp. 20 sec.