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THE 1981 ECLIPSE OF RZ Oph

RZ Oph = BD $+7^{\circ}3832$ is a long period Algol-type binary with P = 261.9277 days. Favorable eclipses occur once every 5 years. The nearest one will occur in the summer of 1981, centered on August 7, 4^{h} UT. The purpose of this note is to give an advertising summary of the properties of this system with the hope that it might get an adequate attention from the observers.

General information

The spectral types of the components are F3Ib and K5Ib (Hiltner 1946, Baldwin 1979). That of the primary is too late for its mass and probably includes a contribution or a contamination from the disk. The Balmer emission lines from the disk are seen throughout the orbital cycle and undergo spectacular eclipse effects. The relative size of the primary component is very small, compared to the size of the disk and as a result, unlike in many other Algol-type systems, the disk is a fairly stable feature. The object is bright what makes it an inviting target for a detailed study of its disk.

Photometric effects

The eclipse is total. From fragmentary photometric data (Popper, unpublished; Baldwin 1979) it appears that the magnitude ranges are: V = 9.9-10.6 and B = 10.2-11.7. The duration of the eclipse is about 12-13 days, while the duration of totality is about 8-9 days. A good light curve would be crucial for the geometric solution. It is obvious that a cooperative effort is needed involving observers at different geographical longitudes. Three additional photometric effects are to be looked for in the light curve outside of the primary eclipse:

(1) Since the brightness of the secondary component is comparable to that of the primary, there should be an "ellipticity" effect due to the aspherical shape of the secondary.

(2) It is likely that the disk contributes a non-negligible fraction of the combined light in the continuum and if so the effects of its eclipse by the secondary should be visible well before the first and after the fourth contacts.

(3) If the disk is optically thick in the continuum, the effects of the partial occultation of the secondary by the disk should be visible around phase 0.5P. The nearest opportunity will be in August-September 1982.

Spectroscopic effects

Spectacular behavior of the double ($V_d \sin i$ = 115 km/s) emission lines during the eclipse, first observed by Hiltner (1946), was studied recently by Baldwin (1979; cf. a rediscussion of his data by Smak (1981)). From Baldwin's data it appears that the disk eclipse lasts for about 36-48 days. Good scanner observations with a high spectral resolution can give a wealth of information concerning the structure of the disk. (A good example of an analysis of this type can be found in Young and Schneider (1980)).

Other spectral regions

Nothing is known about RZ Oph in the far UV, X-ray and radio regions. The prospects of studying the eclipse effects in these domains can hardly be overemphasized!

Time-table for 1981

All predictions given below are very uncertain and should be used only as a guide in planning the observations.

Disk eclipse likely to begin . .	July 13	
Disk eclipse certain to begin. .	July 19	
1-st contact	July 31	15^h UT ± 12^h
2-nd contact	Aug. 2	23 UT ± 12
3-rd contact	Aug. 11	9 UT ± 12
4-th contact	Aug. 13	17 UT ± 12
Disk eclipse likely to end . . .	Aug. 24	
Disk eclipse certain to end. . .	Aug. 30	

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