ROTATION OF THE PRIMARY COMPONENT OF ALGOL

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1.8 Å segment of the Algol A spectrum centered at 1075.55 Å line of Ni II was scanned repeatedely with the 0.05 Å resolution from the Copernicus satellite. The numerical model is described in which 37 out of the total 55 scans obtained during two eclipses were combined in a least-squares solution, to determine the period of rotation and degree of non-solid rotation of Algol A. The period of rotation suggests full synchronism of rotational and orbital motions; the equatorial velocity is $V_e = 53 \pm 3$ km/s. The non-solid rotation parameter 's' measuring the distribution of angular velocity versus stellar latitude in $\omega = \omega_e (1 - s + s \cos^2 \vartheta)$ has been found equal $s = 0.07 \pm 0.25$ indicating the rotation law not far from solid body.

A full account of this work will appear in Acta Astronomica, Vol.29.

COMMENTS FOLLOWING RUCINSKI

Smith

Do you know how sensitive your result is to the assumed geometry?

Rucinski

The result is highly model-dependent since many assumptions about geometry were made (the axis of rotation parallel to that of revolution, Roche geometry for the secondary component, etc. etc.).

* Guest Investigator with the Princeton University telescope on the 'Copernicus' satellite, which is sponsored and operated by the National Aeronautics and Space Administration.

M. J. Plavec, D. M. Popper and R. K. Ulrich (eds.), Close Binary Stars: Observations and Interpretation, 223–224.

Popper

You show a limb-darkening coefficient in the line greater than unity. Can you comment on its significance?

Rucinski

The limb-darkening law is certainly non-linear; to have the smallest number of free parameters, the linear law was assumed. The accuracy of this determination is low, which might be related to this non-linearity.

Chen

I am glad to see Dr. Rucinski's result. The study of Mg II k line profiles during primary eclipses also indicates that the rotation of Algol A is synchronous with its orbital revolution.

Guinan

How did you determine your value of the limb-darkening coefficient?

Rucinski

The limb-darkening in the line was assumed to be identical to that in the continuum. This assumption might be obviously questionable but was made to keep the number of free parameters managable.