the observer. The total amplitude of the light curve is 0.4 mag. The explanation for this observed behaviour of the emission is not known; but investigation of this character on this star and other Wolf-Rayet binaries may well lead to a better understanding of Wolf-Rayet stars.

No departures from the mean curve greater than 0.02 mag. were found except on the night of October 5, 1949, when the emission was 0.15 mag. too bright.

The period of CQ Cephei is 1.64 days.

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¹ *Astrophys. J.*, **99**, 273 (1944).

A Light Curve for the Magnetic Variable Star HD125248

THE A_0 star HD125248 (BD - 18°3789 Virginis) exhibits periodic changes¹ in the intensities of its absorption lines, principally those due to europium II and chromium II, with a period² of 9.295 days; the Eu II lines have their maximum intensity when the Cr II lines are a minimum and vice versa. Babcock³ finds that this star has a magnetic field which varies with the same period as the absorption lines, the polar field-strength being between 7,000 to 8,000 gauss towards the earth when the Eu II lines have their greatest intensity, and of the order of 6,000 gauss of opposite polarity at the Eu II minimum. The light curve of this star was not hitherto known but has been determined at the Commonwealth Observatory in view of the remarkable interest of this star in connexion with the current theory of magnetism of rotating bodies. The results obtained with the 9-inch Oddie refractor and an IP21 electron multiplier are shown in the accompanying graph. The light curve is well defined, the range of the variability being 0.054 mag. with the above period.

Further details will appear later.

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¹ Morgan, W. W., *Astrophys. J.*, **74**, 24 (1941).

² Deutsch, A. J., *Astrophys. J.*, **105**, 283 (1947).

³ Babcock, H. W., *Pub. Astro. Soc. Pacific*, **59**, 260 (1947).

Frequency-Selective Heating at Radio Frequencies

THE differential heating of the components of a heterogeneous mixture by radio-frequency fields is a well-known fact^{1,2}, and the variation of the effect with frequency is often regarded as an important principle in various applications of radio- and micro-waves, for example, short-wave therapy and radio-heating. The following observations seem to establish, for the first time it is believed, the existence of a peak in the curve showing differential heating over a band of radio-frequencies.

We put a small bulb filled with water into a bath of transformer oil and kept the whole in a high-frequency field. The rises in temperature of oil and water, Δt_1 and Δt_2 , were recorded constantly, and the ratio $\Delta t_2/\Delta t_1 = \Theta$ was taken after it became constant. When we plot Θ against frequency f , we find a sharp maximum, showing that water in the bulb has undergone a maximum heating at this frequency. (The experimental values are shown as small circles in the accompanying figure.)

Δt_2 = rise in temp. of water; Δt_1 = rise in temp. of oil; $\Theta = \Delta t_2/\Delta t_1$. O—O—, observed; — and ---, calculated

If we denote the amounts of energy absorbed by oil and water by P_1 and P_2 respectively, it is readily shown that

$$\frac{P_2}{P_1} = \frac{1}{1 + \omega^2 T^2} \frac{9\sigma_1\sigma_2}{(2\sigma_1 + \sigma_2)^2} + \frac{\omega^2 T^2}{1 + \omega^2 T^2} \left(\frac{3\varepsilon_1}{2\varepsilon_1 + \varepsilon_2} \right)^2 \frac{\sigma_2}{\sigma_1}$$

where $T = \frac{2\varepsilon_1 + \varepsilon_2}{4\pi(2\sigma_1 + \sigma_2)}$ and $R_2 \ll R_1$.

Inserting the observed values of the dielectric constants ε_1 , ε_2 , and the conductivities σ_1 , σ_2 of the oil and water into this equation, we calculated P_2/P_1 for a wide range of frequency, and then by the use of thermal data we estimated Θ from it. The resultant