RAPID OSCILLATIONS OF CI AUR AND AQ TAU

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(Not reviewed)

Photoelectric (UBV) observations were made with the 91-cm telescope of McDonald Observatory of CI Aur (P=1^{d}870) and AQ Tau (P=1^{d}216) from November 1984 to January 1985. The light-curves showed obvious disturbances, including apparent "flickering", but do not appear to show secondary minima. There is a "dip" in each light-curve near phase 0P1. Average values of the colour indices outside eclipse were (B-V)=0^{m}860, (U-B)=0^{m}432 for CI Aur and 1^{m}15 and 0^{m}59, respectively, for AQ Tau. During eclipse, CI Aur is redder.

The light fluctuations outside eclipse were studied by autoregressive (AR) power spectrum and harmonic analysis. We analyzed only periods of brightness variation in the range from 4 minutes (the least time between observations) and 7 hours (the longest extent of observation). Table I lists the quasi-periods and amplitudes found.

TABLE I. Results of AR Analysis

Star	V		B		U	
	P	A	P	A	P	A
CI Aur	0^{d}2508	0^{m}021	0^{d}2485	0^{m}037	0^{d}2457	0^{m}089
	0.1121	0.042	0.1306	0.053	0.1055	0.076
	0.0392	0.022	0.0362	0.021	0.0389	0.042
AQ Tau	0.1880	0.076	0.1899	0.039	0.1820	0.023
	0.1226	0.046	0.0964	0.026	0.1024	0.040
	0.0490	0.047	0.0469	0.025	0.0485	0.029

These systems appear to be semi-detached, possibly in slow mass-transfer, with matter flowing from secondary to primary through L_1. Atmospheric oscillations could be caused by interactions of the stream with the mass-gaining star, or its accretion disk. For CI Aur we derived r_1/a=0.105, q=0.687, i=74°.42 and the radius of the accretion disk 0.212 solar radii. The "dips" in the light-curves may be caused by the occultation of hot spots by the primary star or the disk.

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