

High Dispersion Observations of ϵ Aur
from Sept. 1982 to March 1983

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Between September 1982 and March 1983 I obtained high dispersion spectra of ϵ Aur in selected regions using the Palomar 200-inch coude spectrograph and the Dominion Astrophysical Observatory 48-coude spectrograph. All spectra were taken with the 90-mm ITT image tube and IIA-D emulsion. Since further observations during this eclipse are not currently planned, the raw data will be presented here for others who may find them useful.

In Table 1 we list our radial velocities for the sodium D lines, KI lines, H α , and a few other features. While most of the sodium and potassium features are surely circumstellar there is certainly an interstellar component present. In the direction of ϵ Aur interstellar gas is seen mostly with radial velocities between +5 and +10 km s⁻¹. The sodium D lines and potassium lines show incipient resolution which may involve the interstellar components.

The equivalent widths of the sodium and potassium lines are given in Table 2. For potassium, blending with atmospheric O₂ makes the line at λ 7664 unmeasurable on the dates of these observations. The increase in equivalent widths already noted by Pathasarathy and Lambert is evident.

Blending and partial resolution of the circumstellar and interstellar features may account for much of the velocity structure which is only partially discernable at the available resolution.

This research was conducted by the author as a guest investigator at the Palomar Observatory, Calif. Inst. of Technology and the Dominion Astrophysical Observatory, Herzberg Institute for Astrophysics, National Research Council, Canada.

TABLE 1

Date (UT)	Disp	metals	Radial Velocity (km s^{-1})		NaI	KI	OI ($\lambda 7772$)
			H α (abs)	H α (em)			
3.53 Sept. 1982	6.7A/mm	+3.5 \pm 1.1	+11.3 \pm 1.0	+72	+12.8	+21.8 \pm 1.5*	+14.3
15.41 Oct. 1982	4.8A/mm				(+19.1 1.4) [†] (+6.7 0.8)		
18.60 Oct. 1982	4.8A/mm					+22.4 \pm 0.5 Δ	
19.17 Mar. 1983	4.8A/mm	+1.5	+25.4 ∇		+15.5 \square		
21.14 Mar. 1983	4.8A/mm				+13.9	+9.9 \pm 1.5 ^{**}	

* partially resolved component at +8 \pm 2 km s^{-1} is present

† two nearly equal components are clearly present but poorly resolved.

Δ partially resolved component at +4 km s^{-1} is present.

∇ the deepest point in the line is at +36.6 km s^{-1} and an uncertain absorption feature may be present at -4.6 km s^{-1} . Weak emission further to the violet may be present.

\square the deepest point of the D2 line is at +5.3 km s^{-1}

** a little fuzz is visible on the positive side of the KI lines.

Table 2
Equivalent Widths (in Å)

Date	D1	D2	KI(λ 7699)
3.53/9/1982	0.77	0.82	0.36
15.41/10/1982	0.95	1.03	-
18.60/10/1982	-	-	0.40
21.14/3/1983	1.24	1.33	0.50

LOWELL OBSERVATORY SPECTROPHOTOMETRY
OF EPSILON AURIGAE 1982-1984.

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<u>Date,M.S.T.</u>	<u>J.D. 2440000+</u>	<u>Wavelength Range</u>	<u>Resolution in Ang.</u>	<u>Std. Star</u>
March 4,1982	5030	Y,R	8	109 Vir
April 4,1982	5063	B	4	109 Vir
Sept. 28,1982	5240	B,Y,R	*	Xi^2 Ceti
Sept. 29,1982	5241	B,Y,R	*	Xi^2 Ceti
Nov. 25,1982	5298	B,Y,R	*	Xi^2 Ceti
Dec. 19,1982	5322	B,Y,R	*	Xi^2 Ceti
Jan. 21,1983	5355	B,Y,R	*	Xi^2 Ceti
Feb. 21,1983	5386	B,Y,R	*	Xi^2 Ceti
March 29,1983	5422	Y,R	8	Xi^2 Ceti
April 17,1983	5441	B,Y,R	*	109 Vir
Oct. 25,1983	5632	B,Y,R	*	Xi^2 Ceti
Nov. 14,1983	5652	B,Y,R	*	Xi^2 Ceti
Nov. 15,1983	5653	B,Y,R	*	Xi^2 Ceti
Dec. 28,1983	5696	B,Y,R	*	Xi^2 Ceti
Jan. 23,1984	5722	B,Y,R	*	Xi^2 Ceti
March 16,1984	5775	B,Y,R	*	109 Vir
April 12,1984	5802	Y,R	8	109 Vir
April 14,1984	5804	B	8	109 Vir
April 15,1984	5805	B,Y,R	8	109 Vir
Sept. 7,1984	5950	B,Y,R	*	Xi^2 Ceti

* Blue resolution 4 Angstroms, Yellow and Red 8 Angstroms
 B=3295 to 5495 Angstroms
 Y=5200 to 7676 Angstroms
 R=7500 to 8880 Angstroms