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SPECTROSCOPIC OBSERVATIONS OF 53 Ari

53 Arietis (HD19374) is frequently listed as a "confirmed" member of the β Cephei (β CMa) class of pulsating variable stars. It has been studied spectroscopically by Blaauw and van Albada (1963), Münch and Flather (1957) and van Hoof and Blaauw (1964). All studies find radial velocity variations of a few km/sec. The latter two consider it to be a short period β Cephei variable ($P \simeq 4^h$), but the former considers any period present to be around 40 days. Bondal (1967) and Jerzykiewicz (1974) have studied 53 Arietis photometrically. Bondal claims to find variations of 0.03 to 0.07 magnitudes. Jerzykiewicz finds no variation on any one night greater than $0^m.002$ and concludes that the star is constant in light.

In the present study, 53 Arietis was followed spectroscopically over one cycle (3^h37^m) of its suspected variation on October 2-3, 1975. All plates were taken with the 1.88 m telescope of the David Dunlap Observatory on IIa-O emulsions at 12Å/mm. The average exposure time of the plates is 15.5 minutes. The velocities are listed in Table 1 and shown in Figure 1.

In order to determine whether any systematic variation exists in these data, an F-test was performed (Heard 1956). The probability exceeds 25% that the amount of variability seen in the velocities did indeed arise by chance. If the velocity variations found in previous studies are significant they must be due to a long term variation with a period of at least a month.

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Table 1

Radial Velocities of 53 Arietis

Julian Date (Heliocentric)	Velocity (km/sec)	Probable Error (km/sec)
2442688+		
.782	21.9	1.3
.793	21.0	0.8
.803	20.7	1.0
.813	22.3	1.4
.823	22.7	0.8
.833	21.2	0.9
.843	22.0	0.9
.853	22.4	1.5
.863	21.7	1.0
.875	22.2	1.2
.898	22.6	0.9
.909	23.4	0.8
.921	22.8	0.9

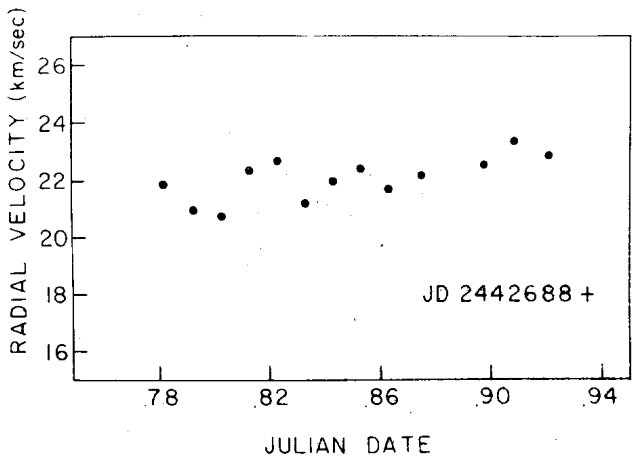

Figure 1 - Radial velocity versus Julian date for 53 Arietis.

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