On the variability of NSV 3690 CMi

NSV 3690 is a probable short period variable star of magnitude 11, situated about a degree south of Procyon, at position $7^h39^m01^s$ +3°47:3 (1950). It was discovered by Nekrasova in 1938, with a probable magnitude range of 10.7 to 12.1. It is therefore observable with a 15 cm telescope. Finding charts adapted from The Falkau Atlas and the Atlas of Finding Charts are given in figure 1.

The author made 70 observations of this star during a 14-day period in February 1985, using a 254 mm telescope. The observations showed rapid variability of small amplitude. A PDM-nalysis (see Stellingwerf, Astroph. J. 224, 953 (1978)) of the observations revealed a possible frequency or alias-frequency of 12.155 $\pm$ 0.014 c/d (see figure 2). The table gives the ten most important frequencies in the range 5 to 15 c/d.

The resulting phase diagram is given in figure 3. The comparison star C is given the arbitrary brightness 0, an D the brightness 10. Although the scatter around the mean curve is quite large, the remaining standard deviation of the observations after prewhitening for the frequency found above, is about the same as one can expect from visual observations (0.1 mag), and 2.5 times smaller than the mean amplitude.

From the resulting period (0.0823 $\pm$ 0.0001 d), the amplitude (less than 0.5 mag), and the shape of the light curve, it may be concluded that NSV 3690 is of the Delta Scuti type. A number of observations by Roland Boninsegna seem to support this conclusion. However more observations, preferably photoelectric, are needed to confirm this result.

The calculations were done with an IBM-compatible PC, using a program written in Turbo-Pascal. I thank Christian Steyaert for plotting the diagrams.

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Frequency (c/d)	θ	Identification
12.155 ± 0.014	0.674	f
11.155	0.680	f - 1
10.125	0.682	f - 2
9.125	0.712	f - 3
5.580	0.712	$\frac{1}{2}$(f - 1)
6.595	0.727	$\frac{1}{2}$(f + 1)
13.170	0.728	f + 1
10.268	0.748	f - 2 + 2/T
8.110	0.751	f - 4
5.079	0.757	$\frac{1}{2}$f

T = length of observation
interval (= 14 days).

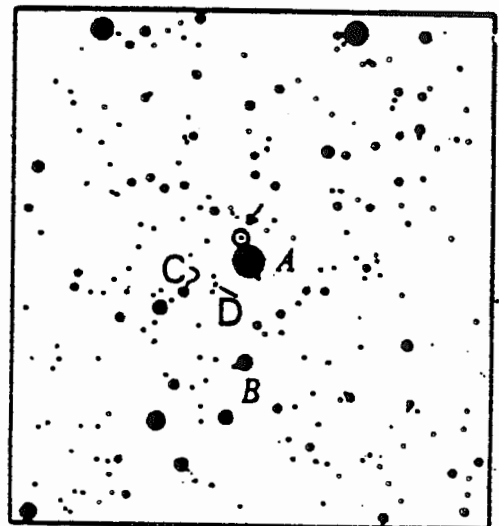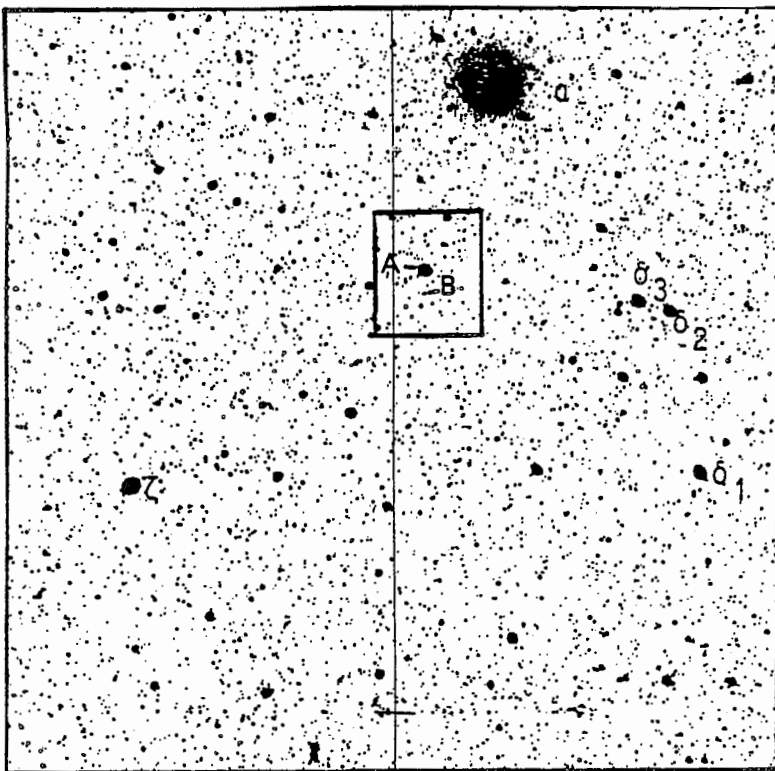Figure 1 : Finding charts for NSV 3690 (north is above).
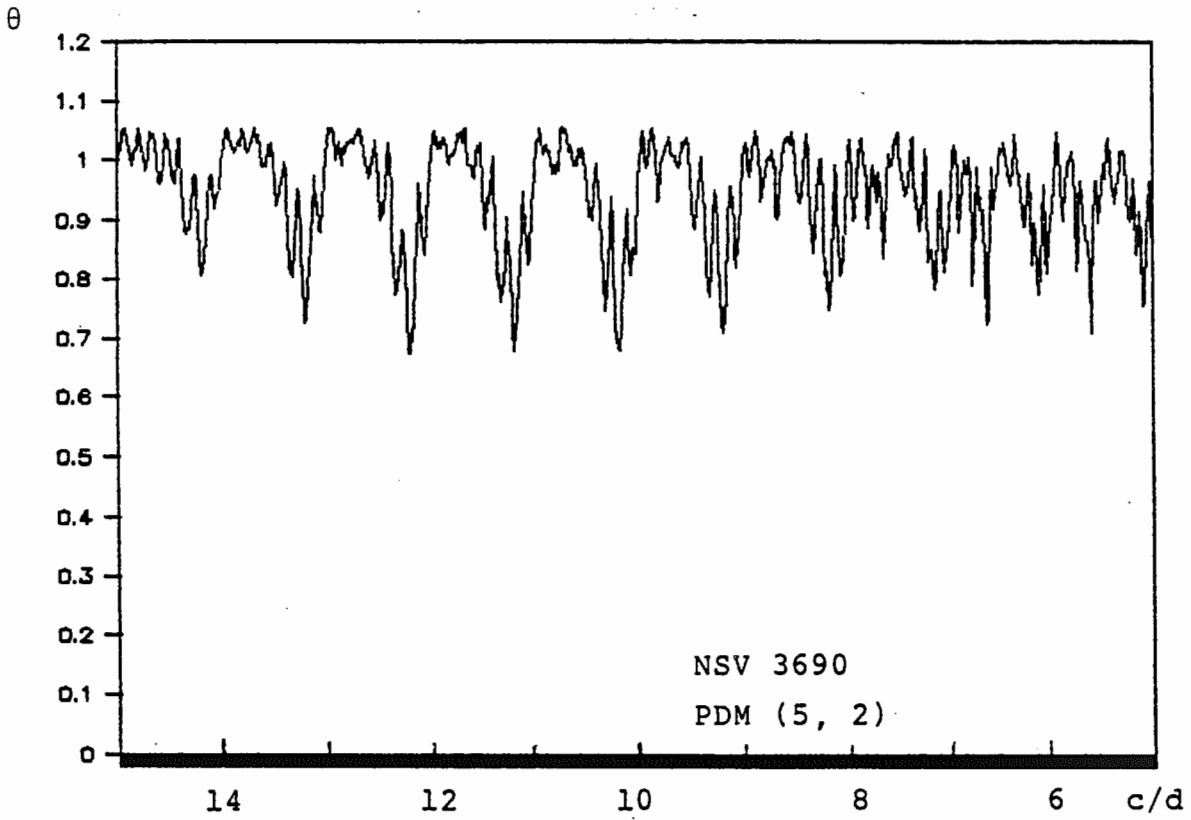
Figure 2 : PDM-analysis of the observations of NSV 3690.

Figure 3 : Phase diagram of NSV 3690, for P = 0.0823 days.