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GSC 223:1761 - A NEW DELTA SCUTI VARIABLE STAR IN CANCER

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On UT 98 March 13 (JD 2450885.5), images using the 0.61 m telescope at the US Air Force Academy (USAFA) and a liquid nitrogen cooled 512x512 Photometrics CCD were taken of the asteroid 583 Klotilde to determine the asteroid's rotational period (Burtz and Wetterer 1998). Differential photometry between Klotilde and comparison stars within the same field of view revealed that one of the comparison stars (GSC 223:1761) was varying with an amplitude of δR < 0.1 magnitudes and a period of about 2 hours.

The General Catalog of Variable Stars (Kholopov et al. 1985-88) and subsequent namelists (Kholopov et al. 1985, 1987, 1989; Kazarovets and Samus 1990, 1995, 1997; Kazarovets et al. 1993) were searched and this star has not been previously identified as variable. Figure 1 is a finder chart made from a scan of the Palomar Digitized Sky Survey and identifies the variable star (GSC 223:1761) and the two comparison stars used (GSC 223:1066 and GSC 223:592). GSC 223:1761's 2000.0 coordinates are $8^h38^m09\overset{s}{.}7$ and $+7°13'33''$, obtained from the Hubble Space Telescope Guide Star Catalog (GSC). The GSC lists a magnitude of 11.27 $\pm$ 0.40 for this star.

Subsequent observations at USAFA were made to better define the star's type and period with the 104 HJDs (minus 2450000) and instrumental R magnitudes listed in Table 1. The data from UT 98 Mar 13 (JD 2450885.5) was continuous with three maxima and two minima and indicates a period of 0.087 $\pm$ 0.007 days, although other lower amplitude periods are likely due to the variations in minimum and maximum light from cycle to cycle. By visually inspecting composite lightcurves using periods from 0.080 to 0.0 95 days and all four nights of data, this period was refined to 0.08735 $\pm$ 0.00003 days (2.0964 $\pm$ 0.0007 hours). The observed amplitude of ΔR = 0.084 $\pm$ 0.004 corresponds to the full range of all observations. The composite lightcurve using this period is shown in Figure 2. The period, amplitude, and lightcurve characteristics are consistent with a designation as a Delta Scuti type variable star.

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Table 1: R observations of GSC 223:1761

HJD	R	HJD	R	HJD	R	HJD	R
885.61377	11.169	885.71755	11.176	897.75094	11.210	907.59767	11.229
885.61816	11.172	885.72146	11.188	897.75982	11.192	907.60191	11.233
885.62218	11.167	885.72640	11.192	897.76363	11.184	907.60601	11.223
885.62704	11.169	885.73042	11.203	897.76754	11.176	907.63865	11.152
885.63122	11.167	885.73433	11.208	897.77959	11.189	907.64282	11.164
885.63508	11.173	885.73821	11.216	897.78361	11.192	907.64698	11.173
885.63899	11.183	885.74211	11.223	897.78754	11.199	907.65115	11.185
885.64303	11.190	885.74598	11.230	897.79172	11.221	907.67580	11.223
885.64692	11.199	885.74990	11.234	897.80399	11.234	907.67997	11.224
885.65098	11.200	885.75384	11.232	897.80782	11.234	907.68414	11.219
885.65488	11.208	885.75810	11.223	897.81169	11.236	907.68831	11.222
885.65881	11.218	885.76242	11.228	897.81582	11.230	907.70810	11.202
885.66272	11.221	885.76631	11.228	897.82811	11.232	907.71354	11.195
885.66663	11.222	885.77029	11.227	897.83201	11.217	907.71832	11.185
885.67053	11.224	885.77427	11.217	904.65432	11.168	907.72253	11.175
885.67443	11.228	885.77820	11.211	904.65768	11.169	907.74788	11.204
885.67830	11.226	885.78213	11.204	904.66187	11.170	907.75203	11.210
885.68222	11.221	885.78601	11.189	904.66760	11.173	907.75625	11.212
885.68611	11.217	885.78990	11.189	904.67240	11.174	907.76051	11.232
885.68999	11.209	885.79383	11.180	904.67704	11.179	907.77761	11.207
885.69389	11.198	885.79789	11.182	904.68162	11.186	907.78258	11.225
885.69781	11.188	885.80180	11.184	904.68564	11.199	907.78681	11.216
885.70179	11.180	885.80572	11.194	904.69406	11.212	907.79103	11.204
885.70566	11.173	885.80974	11.194	904.69906	11.219	907.81355	11.196
885.70971	11.175	897.73253	11.228	904.70302	11.224	907.81812	11.186
885.71361	11.172	897.73761	11.226	907.59159	11.237	907.82248	11.189

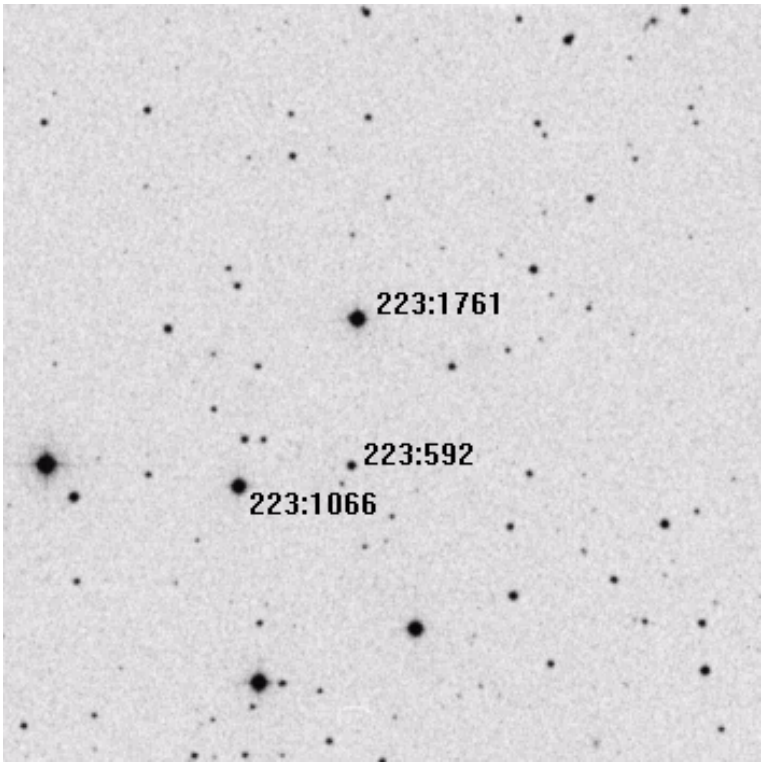

Figure 1. Finder chart for GSC 223:1761 (10′× 10′). North is up and East is to the left

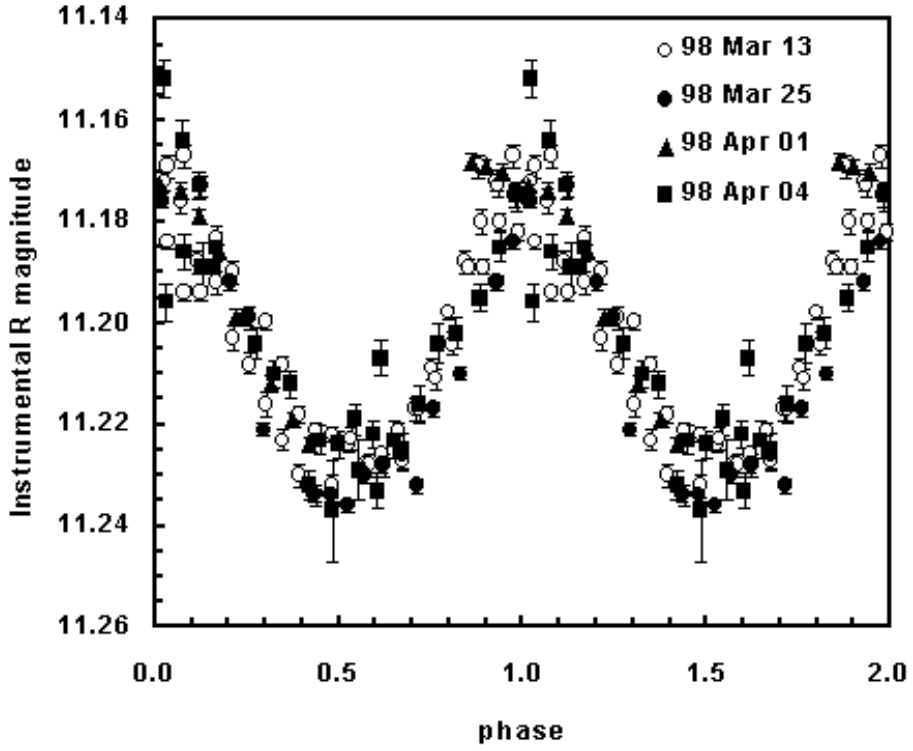

Figure 2. Lightcurve of GSC 223:1761 with 2.0964 hour period

References:

Burtz, D.C. and Wetterer, C.J., 1998, *MPB*, **25**, 25.
Kazarovets, E.V. and Samus, N.N., 1990, *IBVS*, No. 3530
Kazarovets, E.V. Samus, N.N. and Goranskij, V.P., 1993, *IBVS*, No. 3840
Kazarovets, E.V. and Samus, N.N., 1995, *IBVS*, No. 4140
Kazarovets, E.V. and Samus, N.N., 1997, *IBVS*, No. 4471
Kholopov, P.N. 1985-88, General Catalogue of Variable Stars, 4th edition (Nauka, Moscow)
Kholopov, P.N. et al., 1985, *IBVS*, No. 2681
Kholopov, P.N. et al., 1987, *IBVS*, No. 3058
Kholopov, P.N. et al., 1989, *IBVS*, No. 3323