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**FOUR NEW HIGH AMPLITUDE  $\delta$  SCUTI STARS**

WILS, PATRICK<sup>1</sup>; GREAVES, JOHN<sup>2</sup>; OTERO, SEBASTIÁN A.<sup>3</sup>

<sup>1</sup> Vereniging Voor Sterrenkunde, Belgium; e-mail: patrick.wils@cronos.be

<sup>2</sup> Borrowdale Walk, Northampton, UK

<sup>3</sup> Grupo Wezen 1 88, Centro de Estudios Astronómicos (CEA), Liga Iberoamericana de Astronomía (LIADA); e-mail: varsao@fullzero.com.ar

Using ASAS3 survey data (Pojmanski, 2002), a number of selected regions in the Southern sky has been examined for new variable stars. For more details, see Greaves et al. (2004). This revealed four previously unknown high amplitude  $\delta$  Scuti variable stars (HADS). These are presented in Table 1, which lists the identity, coordinates (from UCAC2, Zacharias, et al., 2003), Galactic latitude  $b$ ,  $V$  magnitude range (from ASAS3), 2MASS  $J - K_s$  colour, epoch of maximum (HJD - 2450000) and period in days. An additional column in the electronic version of the IBVS also provides a link to the source of the data. Table 2 contains the invariant Fourier parameters to degree 3 (for the definition, see Morgan, 2003), calculated from the ASAS3 data. Figs. 1 to 4 provide phase plots for these new HADS variables.

Notes on individual stars:

*GSC 7740-1289* and *GSC 6698-0302*: The Galactic latitude suggests that these are Population II objects, however the proper motions in both cases are very small. On the other hand, the periods are a little long for SX Phe stars, although neither the small proper motions nor the periods are unprecedented for such stars. Among the HADS, the only confirmed field SX Phe star with a period longer than 0.1 days is XX Cyg (Rodríguez and Breger, 2001). A determination of their metallicities or  $m_1$  indices via Strömgren photometry is necessary to show whether these stars are of the SX Phe type instead. *GSC 6698-0302* = NSV 6068, discovered by Hoffmeister (1933).

*GSC 9024-0007*: This star is probably reddened, as there are dark and bright nebulae nearby. Johnson UBV photometry would be useful in this regard.

*GSC 7892-1411*: NSV 9245, discovered by Strohmeier (1967). Spencer and Jackson (1939) give the spectral type A3,  $B - V = +0.22$  (ESA, 1997).

Table 1. Positional and photometric details for the new HADS.

GSC	RA (J2000) Dec	$b$	$V$	$J-K_s$	Epoch	Period
7740-1289	11 34 44.97 -38 25 49.1	+22.0	12.26-12.67	+0.14	1962.856	0.129485
6698-0302	13 02 45.49 -23 58 13.2	+38.8	10.84-11.46	+0.20	2432.684	0.158491
9024-0007	15 00 12.94 -62 54 03.2	-3.1	10.52-11.22	+0.23	2832.661	0.101565
7892-1411	17 37 41.71 -42 31 04.9	-5.8	10.01-10.58	+0.27	2057.700	0.117031

Table 2. Fourier parameters for the new HADS.

GSC	$R_{21}$	$\Phi_{21}$	$R_{31}$	$\Phi_{31}$
7740-1289	$0.37 \pm 0.05$	$4.13 \pm 0.16$	$0.20 \pm 0.05$	$2.35 \pm 0.18$
6698-0302	$0.39 \pm 0.01$	$4.08 \pm 0.03$	$0.17 \pm 0.01$	$2.29 \pm 0.04$
9024-0007	$0.39 \pm 0.01$	$4.18 \pm 0.04$	$0.18 \pm 0.01$	$2.13 \pm 0.08$
7892-1411	$0.44 \pm 0.01$	$4.03 \pm 0.03$	$0.19 \pm 0.01$	$1.76 \pm 0.06$

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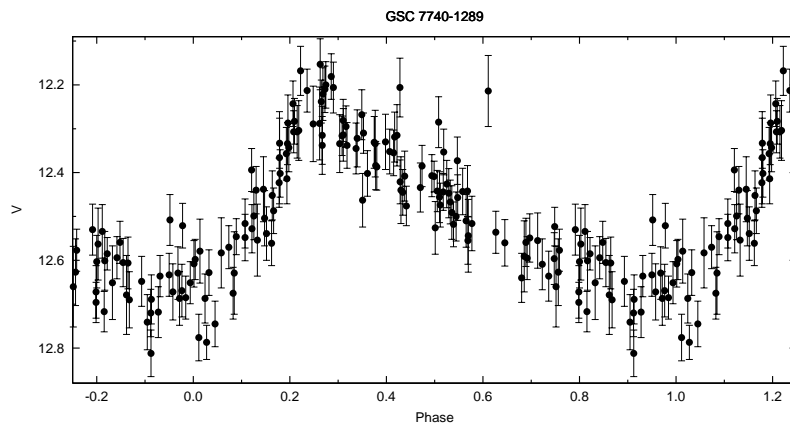
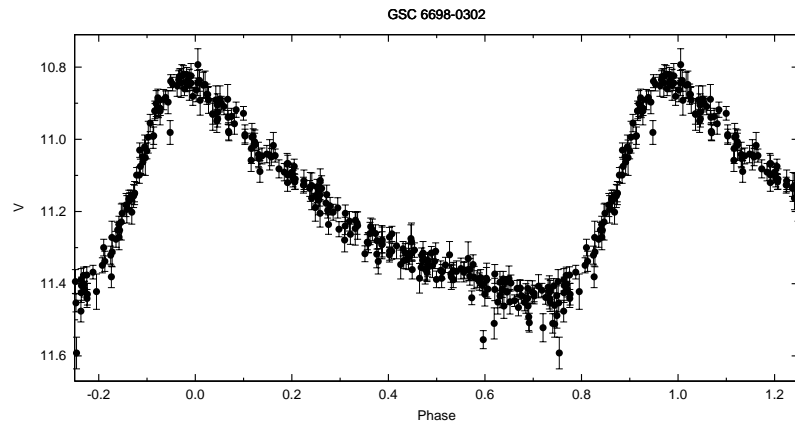
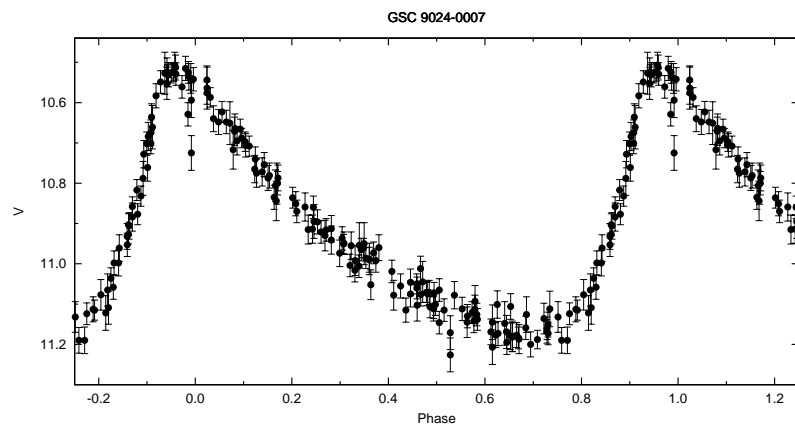


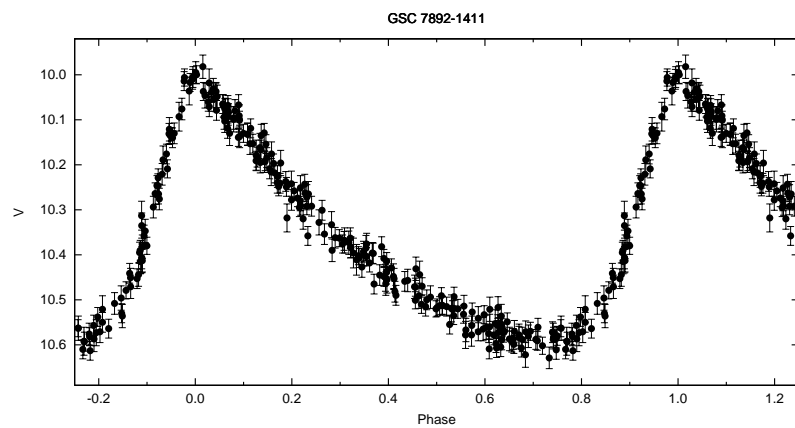
Figure 1. ASAS3 phased light curve for GSC 7740-1289



**Figure 2.** ASAS3 phased light curve for GSC 6698-0302 = NSV 6068



**Figure 3.** ASAS3 phased light curve for GSC 9024-0007



**Figure 4.** ASAS3 phased light curve for GSC 7892-1411 = NSV 9245