"Peremennye Zvezdy",
Prilozhenie,
vol. 10, N 15 **(2010)**

Multiperiodic Delta Scuti Variables with Nonradial Pulsations

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Received: 7.03.2010; accepted: 6.05.2010
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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		TYC 8590 00384 1, HD 302079	09 04 45.95, -56 25 03.5	DSCT	9.56	9.70	V	(see Comments)	(see Comments)	max	A5	Comm. 1	1.PNG		ASAS 090446-5625.1
2		TYC 8948 00036 1	09 14 55.63, -64 01 33.0	DSCT	10.71	11.01	V	(see Comments)	(see Comments)	max		Comm. 2	2.PNG		ASAS 091455-6401.6
3		TYC 7697 03154 1	09 46 23.30, -39 56 56.8	DSCT	9.68	9.83	V	(see Comments)	(see Comments)	max		Comm. 3	3.PNG		ASAS 094623-3957.0
4		TYC 8598 01984 1, HD 298732	09 52 19.96, -54 14 29.9	DSCT	10.23	10.41	V	(see Comments)	(see Comments)	max	A3	Comm. 4	4.PNG		ASAS 095220-5414.5
5		TYC 8211 01725 1	10 57 19.15, -50 57 52.4	DSCT	11.05	11.27	V	(see Comments)	(see Comments)	max		Comm. 5	5.PNG		ASAS 105719-5057.9
6		TYC 9020 00319 1	15 03 06.66, -60 27 57.5	DSCT	10.11	10.32	V	(see Comments)	(see Comments)	max		Comm. 6	6.PNG		ASAS 150306-6028.0
7		TYC 9027 02560 1	15 44 58.70, -62 36 55.6	DSCT	10.87	11.08	V	(see Comments)	(see Comments)	max		Comm. 7	7.PNG		ASAS 154459-6236.9
8		TYC 8727 00855 1	17 10 21.96, -54 15 04.7	DSCT	10.20	10.40	V	(see Comments)	(see Comments)	max		Comm. 8	8.PNG		ASAS 171022-5415.1
9		TYC 7416 00561 1	18 48 06.96, -35 13 42.3	DSCT	11.14	11.36	V	(see Comments)	(see Comments)	max		Comm. 9	9.PNG		ASAS 184807-3513.7
10		TYC 6875 00773 1, HD 181719	19 22 26.27, -22 34 42.5	DSCT	9.42	9.61	V	(see Comments)	(see Comments)	max	F0IV	Comm. 10	10.PNG		ASAS 192226-2234.7
11	NSV 12879	TYC 1618 00812 1, HD 355080	20 11 38.88, +16 06 27.9	DSCT	8.93	9.12	V	(see Comments)	(see Comments)	max	F0	Comm. 11	11.PNG		ASAS 201139+1606.4

Comments:

1.

TYC 8590 00384 1 = HD 302079 = ASAS 090446-5625.1

B-V = 0.452 (Tycho2), J-H = 0.159 (2MASS), Spectral type: A5.
P = 0.17544 d, DSCT/EC/ESD (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	5.69995	0.033	0.1754402	2453400.089
f2	5.87486	0.015	0.1702168	2453400.163

f3	5.57250	0.008	0.1794528	2453400.127
f4	9.21832	0.006	0.1084796	2453400.053

2.

TYC 8948 00036 1 = ASAS 091455-6401.6

B-V = 0.455 (Tycho2), J-H = 0.184 (2MASS).
P = 0.154198 d, DSCT (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	6.485320	0.076	0.1541944	2452614.704
f2	6.720177	0.025	0.1488056	2452614.731
f3	6.609512	0.016	0.1512971	2452614.718

3.

TYC 7697 03154 1 = ASAS 094623-3957.0

B-V = 0.436 (Tycho2), J-H = 0.135 (2MASS).
P = 0.152365 d, DSCT (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	6.563196	0.039	0.1523648	2453600.117
f2	6.228950	0.020	0.1605407	2453600.089
f3	6.48210	0.017	0.1542710	2453600.120
f4	6.99815	0.009	0.1428950	2453600.018

4.

TYC 8598 01984 1 = HD 298732 = ASAS 095220-5414.5

B-V = 0.505 (Tycho2), J-H = 0.152 (2MASS), Spectral type: A3.
P = 0.168942 d, DSCT (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	5.919205	0.046	0.1689416	2453600.078
f2	5.663229	0.022	0.1765777	2453600.121

5.

TYC 8211 01725 1 = ASAS 105719-5057.9

B-V = 0.394 (Tycho2), J-H = 0.091 (2MASS).
P = 0.048799 d, DSCT (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	20.49243	0.063	0.0487985	2453500.0095
f2	20.73876	0.017	0.0482189	2453500.0195

6.

TYC 9020 00319 1 = ASAS 150306-6028.0

B-V = 0.565 (Tycho2), J-H = 0.201 (2MASS).
P = 0.152295 d, DSCT/DSCTr (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	6.56620	0.059	0.1522950	2453500.077
f2	7.93107	0.019	0.1260864	2453500.038
f1+f2	14.49727	0.009	0.0689785	2453500.044

The P2/P1 ratio (0.8279) is close to that typical of the first and second overtone modes (P2/P1 = 0.80).

7.

TYC 9027 02560 1 = ASAS 154459-6236.9

B-V = 0.309 (Tycho2), J-H = 0.126 (2MASS).

P = 0.130132 d, DSCT/EC/ESD (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	7.68451	0.042	0.1301318	2453600.039
f2	8.16955	0.034	0.1224057	2453600.091

8.

TYC 8727 00855 1 = ASAS 171022-5415.1

B-V = 0.412 (Tycho2), J-H = 0.203 (2MASS).
P = 0.109126 d, DSCT (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	9.16355	0.042	0.1091280	2453500.021
f2	9.36903	0.034	0.1067346	2453500.064
f3	9.15744	0.010	0.1092008	2453500.001
f4	9.15132	0.006	0.1092738	2453500.036
f5	15.40360	0.006	0.0649199	2453500.011

9.

TYC 7416 00561 1 = ASAS 184807-3513.7

B-V = 0.480 (Tycho2), J-H = 0.135 (2MASS).
P = 0.13714 d, DSCT (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	7.29154	0.054	0.1371452	2452796.713
f2	7.43161	0.023	0.1345604	2452796.701

The period P3=0.0821122 d (f3=12.17846 c/d) with an amplitude of 0.008 mag is not excluded.

10.

TYC 6875 00773 1 = HD 181719 = BD-22 5076 =
= ASAS 192226-2234.7

B-V = 0.409 (Tycho2), J-H = 0.087 (2MASS), Spectral type: F0IV.
P = 0.17751 d, DSCT/BCEP (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	5.63359	0.049	0.1775066	2453600.151
f2	5.28671	0.018	0.1891534	2453600.183
f3	4.83146	0.016	0.2069768	2453600.156
f4	5.43772	0.008	0.1839006	2453600.171
f5	5.18874	0.008	0.192725	2453600.028

11.

TYC 1618 00812 1 = HD 355080 = NSV 12879 =
=ASAS 201139+1606.4

B-V = 0.349 (Tycho2), J-H = 0.177 (2MASS), Spectral type: F0.
P = 0.089251 d, DSCT (Pojmanski 2002).

	Frequency, c/d	Semi-amplitude, V mag	Period, days	Epoch, HJD
f1	10.20135	0.048	0.0980262	2453900.007
f2	9.95522	0.036	0.1004498	2453900.080

Remarks:

I present an investigation of 11 known DSCT variables with small amplitudes. The variability of these stars was reported by Pojmanski (2002).

I re-analysed the ASAS-3 data using the period-search software developed by Dr. V.P. Goranskij for Windows environment. According to ASAS-3 data, the variables are multiperiodic Delta Scuti stars. Most harmonics have low amplitudes and are probably nonradial.

References:

Pojmanski, G., 2002, Acta Astronomica, 52, 397