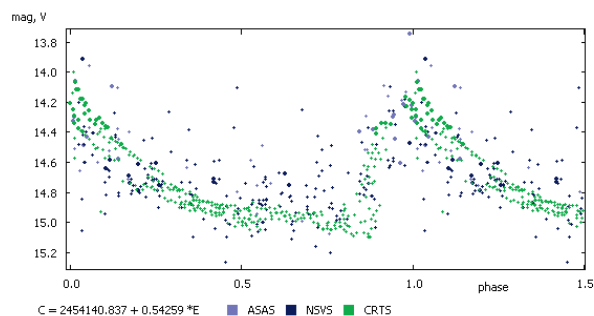


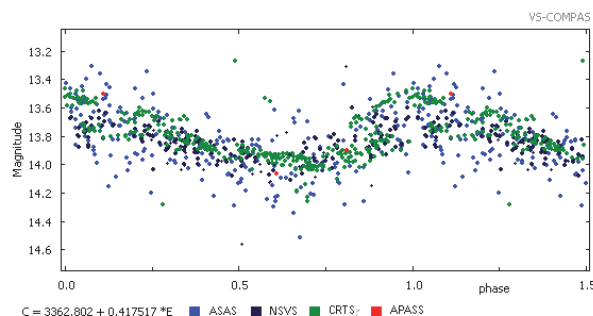
Six new RR Lyrae stars with Blazhko effect

As part of VS-COMPAS data-mining program, here are six new pulsating RR Lyrae variables with the presence of the Blazhko effect listed. The research result on these objects is submitted to the VSX catalog for the first time by the VS-COMPAS team members. Photometric data from publicly available surveys (NSVS, CRTS, ASAS) was used as a source for light curves.

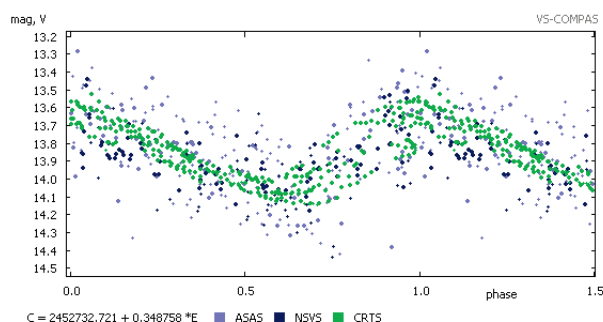
Below each object is presented along with the resulting folded light curve and some notes, if any.



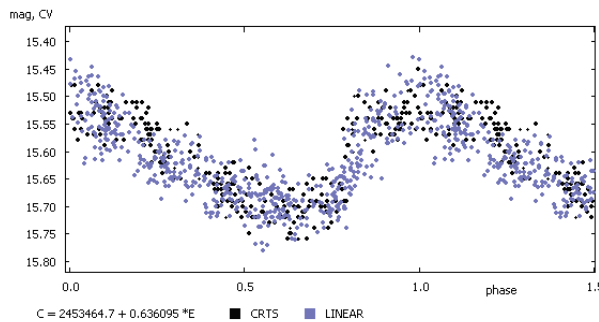
VSX J092806.8+090728 in Leo
by Alexandr Ditkovsky (VS-COMPAS)
J-K = 0.23



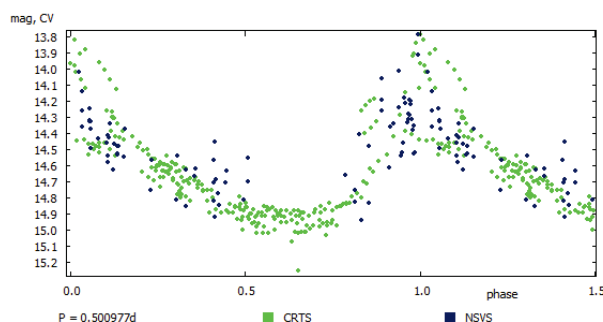
NSVS 10303225 in Leo
by Alexandr Ditkovsky (VS-COMPAS)
NSVS and ASAS-3 data are contaminated by
2MASS J10430453+0903402 (V= 14.9, sep. 24").
Data has been debledned. J-K= 0.23



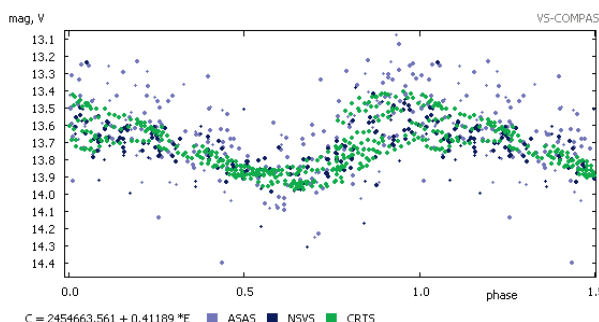
NSVS 13082928 in Leo
by Alexandr Ditkovsky (VS-COMPAS)
J-K = 0.238



CSS J130739.5+011029 in Virgo
by Andrey Prokopovich, Ivan Adamin (VS-COMPAS)
J-K = 0.2. Secondary period is 0.62179



VSX J133154.0+300010 in Canes Venatici
by Alexandr Ditkovsky (VS-COMPAS)



NSVS 10564788 in Bootes
by Alexandr Ditkovsky (VS-COMPAS)
J-K= 0.214

Here is a resulting table containing basic data about the presented variables.

Object Designation	RA (J2000)	DEC (J2000)	Type	Epoch *	Period	Mag. Range
VSX J092806.8+090728	09 28 06.81	+09 07 28.3	RRAB	4140.837	0.54259	14.05 - 15.04 V
NSVS 10303225	10 43 06.15	+09 03 40.4	RRC	3362.802	0.417517	13.48 - 14.05 V
NSVS 13082928	10 57 31.42	+04 57 03.7	RRC	2732.721	0.348758	13.62 - 14.13 V
CSS_J130739.5+011029	13 07 39.46	+01 10 29.0	RRAB	3464.700	0.636095	15.45 - 15.74 CV
VSX J133154.0+300010	13 31 54.00	+30 00 10.9	RRAB	4923.752	0.500977	13.80 - 14.96 CV
NSVS 10564788	15 07 40.60	+12 41 42.9	RRC	4663.561	0.41189	13.32 - 13.92 V

* Epoch is given as HJD-2450000

Ivan Adamin

The Blazhko Effect mystery

The Blazhko effect is a long-term, irregular modulation of the amplitude and period that occurs in some RR Lyrae stars and related pulsating variables. The physical origin of the effect remains unknown for over a century.

RR Lyrae variables are periodic pulsating variable stars with periods of 0.2-1.1 day. They are commonly found in globular clusters. The relationship between pulsation period and absolute magnitude of RR Lyraes allows us to use them as "standard candles" for distance measurements to relatively near objects, particularly within the Milky Way. Having similar light curve properties to Cepheids, the RR Lyraes became distinct from them in the first half of the XX century due to shorter periods and differing locations within the galaxy. Moreover, their chemical differences and metal-poor nature means they are old Population II stars.

Sergey Blazhko (1870 – 1956), a Russian and Soviet astronomer, was the first to report this phenomenon in 1907 for RW Dra.

In 2010, interesting news came from the data analysis of the Kepler spacecraft mission. For V808 Cyg and V355 Lyr stars (which are RR Lyrae stars), the first detection of the period doubling phenomenon is reported. Remarkably, both of these stars exhibit Blazhko modulation as well.

The most plausible theories to explain the phenomenon mostly focus on two types of models, both involving non-radial pulsation components: the resonance models and the magnetic models. There is also the third model which assumes that cycles in the convection cause the alternations and the modulations.

More on the subject can be read in the Doug Welch's article called "The (Now) Less Mysterious Blazhko Effect in RR Lyrae Variables" and "Does Kepler unveil the mystery of the Blazhko effect?" (Szabo et al., 2010).