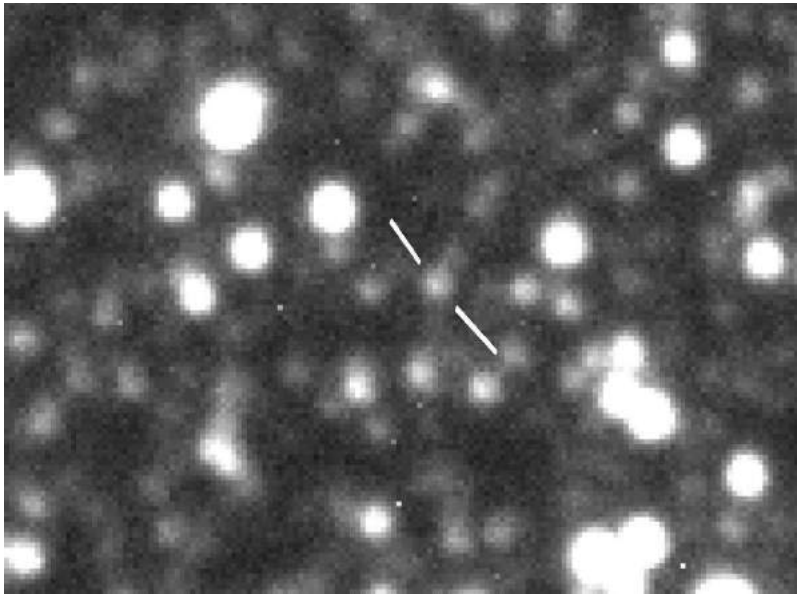
Report for The International Variable Star Index (VSX) of AAVSO
Erwin Schwab, Egelsbach, Germany ***contact: e.schwab@gsi.de*** ***2019-09-05***

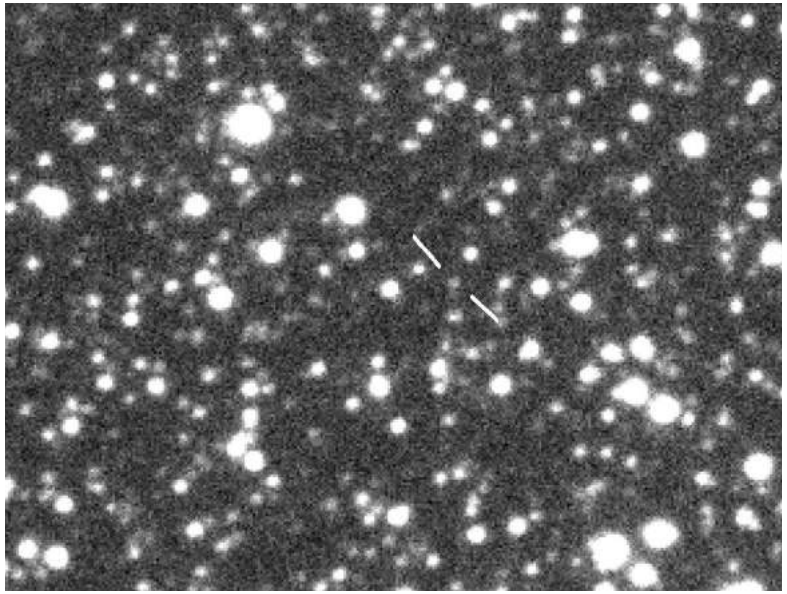
Variable Star **USNO-B1.0 0735-0599207 / Gaia DR2 4102856333775127296** (Ra 18h32m21.56s Dec -16°27‘24.2“)

The **short period** (spin period) looks like a sine wave. It has a period of 0.0474 days with peak to peak amplitude of approximately 1 magnitude.
The **long period** (eclipsing or orbital period) shows drops in brightness of approximately 3 magnitudes with a period of 0.3695 days. The observed descent time is very short, it takes only some minutes from ~17.5mag to ~20.5mag. The observed rising times are different, from approximately 0.5 hours to approximately 6 hours.

While trying to recover comet P/2012 K3 (Gibbs) on 2019-07-26, I have noticed a rapid descent in brightness of this variable star. From 2019-07-26 to 2019-08-28 I could observe the object on 10 nights, 3-4 hours each night, using the 0.8m Schmidt telescope at Calar Alto, Spain (code Z84). The access to the telescope was funded by the European Space Agency (ESA). To cover timespans on which in Europe is daylight, Paul Breitenstein who has access to the 2.0m Faulkes telescope at Siding Spring, Australia (code E10), has provided additional observations on 2019-08-06. After submitting the variable star candidate to VSX it was remarked that the object was also detected by the PanStarrs1 3π survey. However the classification as RR-Lyrae star and its period published by Sesar B. et al. 2017 [1] is different from what is shown in this article. Based on the observations shown here, Ulrich Bastian, Heidelberg, Germany, has tentatively classified the star as cataclysmic variable. The short period could be the spin of the white dwarf star, and the long period could be the orbital period. The different rising times of eclipses could be caused by different density or size of an accretion disk.



The variable Star has one of its brightest moments at 17.4 magnitude
0.8m Schmidt telescope at Calar Alto, Spain.
2019-07-26, 23:13UT. Erwin Schwab



The variable Star has one of its faintest moments at 20.5 magnitude
2m Faulkes south *telescope at Siding Spring, Australia.*
2019-08-06, 08:42UT. Paul Breitenstein

[1] Sesar B. et al. Machine-learned Identification of RR Lyrae Stars from Sparse, Multi-band Data: The PS1 Sample. ApJ **153** 5 (2017)

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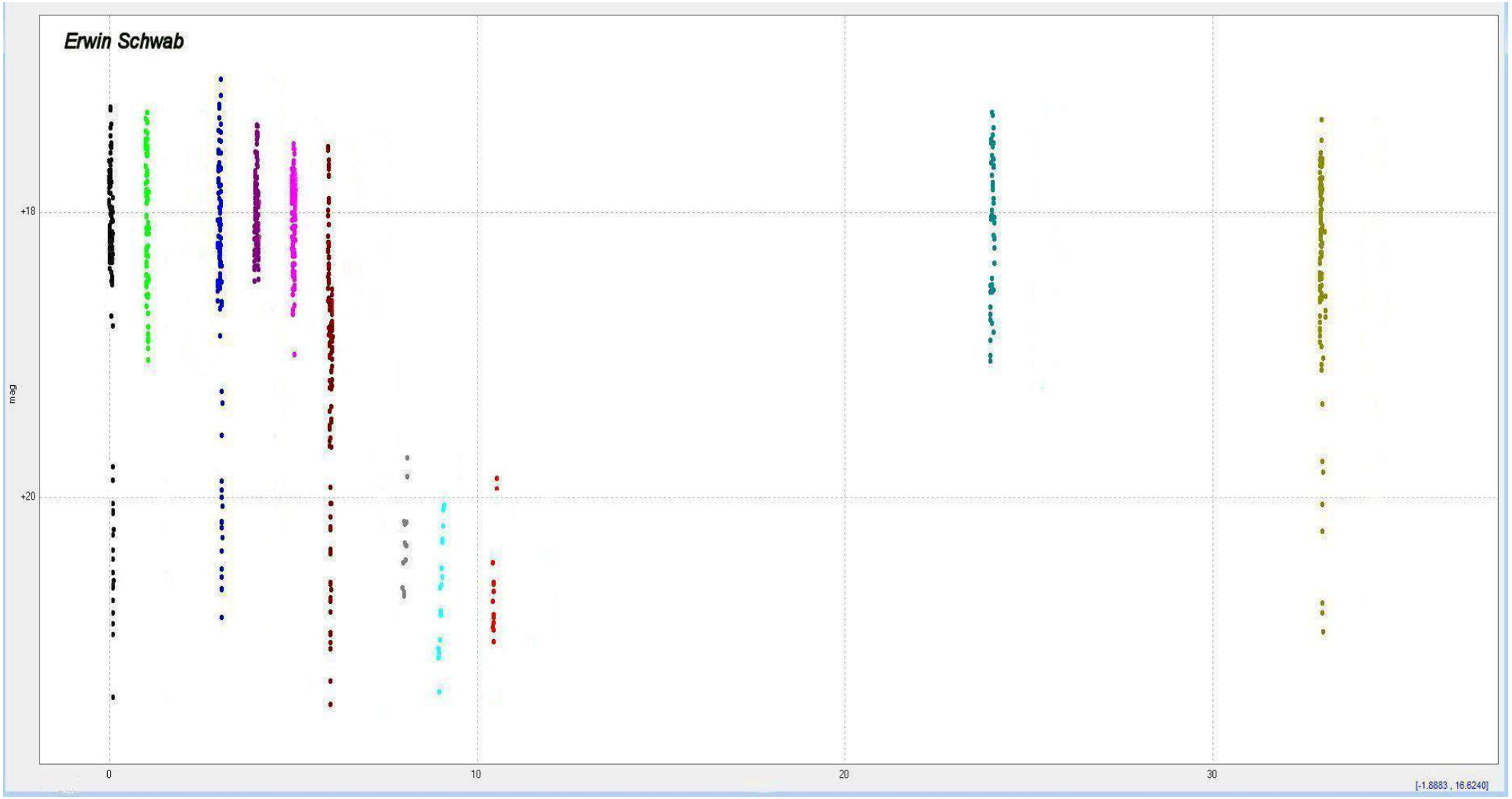
Lightcurve of Variable Star USNO-B1.0 0735-0599207 / Gaia DR2 4102856333775127296

HJD_0 = 2458691.4228

Timespan: HJD 2458691.4228 – HJD 2458724.4974, which are 33 days

The **red** data points are from Paul Breitenstein, all others are from Erwin Schwab.



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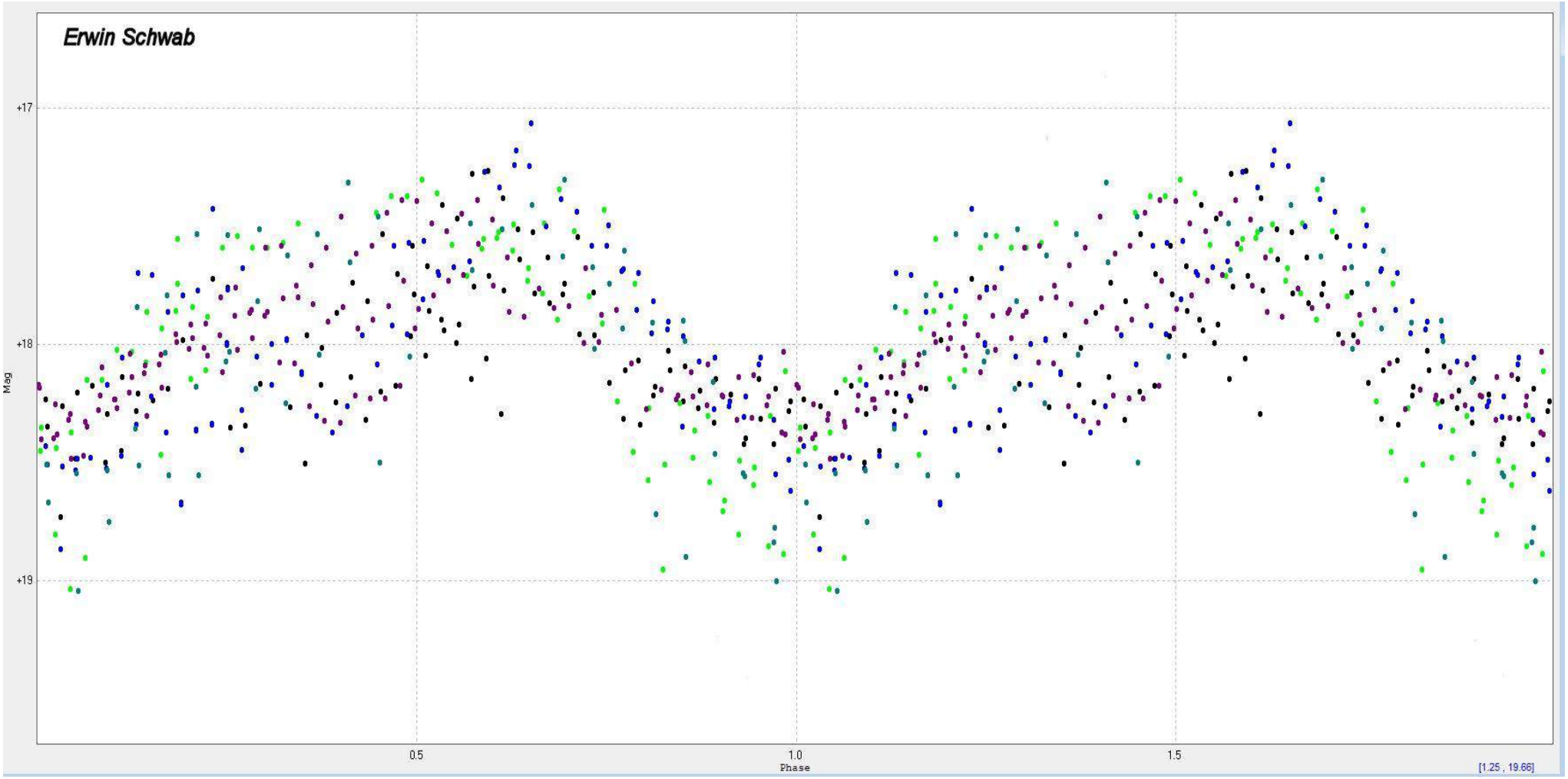
Phased plot of short period

HJD_0 = HJDmin = 2458703.3935 +- 0.0035

Period = 0.04741 d, determination with ANOVA Method of Software Peranso

Timespan: HJD 2458691.4228 – HJD 2458715.4979, which are 507 periods.

For the determination of the short period only time slots outside the eclipses were selected.



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Phased plot of long period

HJD_0 = HJD_{min} = 2458707.7887 +- 0.0035

Period = 0.3695 d, determination with EA Solver Method of Software Peranso

Timespan: HJD 2458691.4228 – HJD 2458724.4974, which are 89 periods

The **red** data points are from Paul Breitenstein, all others are from Erwin Schwab. Measurements marked with the symbol „V“ have SNR below 2.