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Authors	Mackebrandt, F., Mallonn, M., Ohlert, J. M., Granzer, T., Lalitha, S., Garcia Munoz, A., Gibson, N. P., Lee, J. W., SOZZETTI, Alessandro, Turner, J. D., Vanko, M., Strassmeier, K. G.
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[Portal](#) [Simbad](#) [VizieR](#) [Aladin](#) [X-Match](#) [Other](#) [Help](#)**J/A+A/608/A26** TrES-3b UBVIZ' light curves (Mackebrandt+, 2017)

Transmission spectroscopy of the hot Jupiter TrES-3b:
Disproof of an overly large Rayleigh-like feature.

Mackebrandt F., Mallonn M., Ohlert J.M., Granzer T., Lalitha S.,
Garcia Munoz A., Gibson N.P., Lee J.W., Sozzetti A., Turner J.D., Vanko M.,
Strassmeier K.G.
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[=2017A&A...608A..26M](#) (SIMBAD/NED BibCode)

ADC_Keywords: Stars, double and multiple ; Planets ; Photometry, UBVRI ;
Photometry, SDSS

Keywords: planets and satellites: atmospheres - stars: individual: TrES-3 -
methods: data analysis - techniques: spectroscopic -
techniques: photometric

Abstract:

Transit events of extrasolar planets offer the opportunity to study the composition of their atmospheres. Previous work on transmission spectroscopy of the close-in gas giant TrES-3 b revealed an increase in absorption towards blue wavelengths of very large amplitude in terms of atmospheric pressure scale heights, too large to be explained by Rayleigh-scattering in the planetary atmosphere.

We present a follow-up study of the optical transmission spectrum of the hot Jupiter TrES-3 b to investigate the strong increase in opacity towards short wavelengths found by a previous study. Furthermore, we aim to estimate the effect of stellar spots on the transmission spectrum.

This work uses previously published long slit spectroscopy transit data of the Gran Telescopio Canarias (GTC) and published broad band observations as well as new observations in different bands from the near-UV to the near-IR, for a homogeneous transit light curve analysis. Additionally, a long-term photometric monitoring of the TrES-3 host star was performed.

Our newly analysed GTC spectroscopic transit observations show a slope of much lower amplitude than previous studies. We conclude from our results the previously reported increasing signal towards short wavelengths is not intrinsic to the TrES-3 system. Furthermore, the broad band spectrum favours a flat spectrum. Long-term photometric monitoring rules out a significant modification of the transmission spectrum by unocculted star spots.

Description:

We observed transits of the hot Jupiter TrES-3b in Johnson U, B, V, I and Sloan z'. Telescopes are named according to the paper.

We monitored the exoplanet host star TrES-3 with STELLA/WiFSIP in 2016 over the course of four months from March 7 to July 10, 2016. We observed in two filters, Johnson B and Johnson V, in blocks of three exposures each.

Objects:

RA	(2000)	DE	Designation(s)
17 52 07.02	+37 32 46.2		TrES-3 = NAME TrES-3b

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
list.dat	54	17	List of photometric observations
phot/*	108	17	Individual light curve data
vamosb.dat	52	28	Light curve from STELLA in Johnson B filter
vamosv.dat	52	29	Light curve from STELLA in Johnson V filter

See also:

[J/AJ/136/267](#) : Six occultations of the exoplanet TrES-3 (Winn+, 2008)
[J/ApJ/691/1145](#) : Spectrophotometry of TrES-3 and TrES-4 (Sozzetti+, 2009)
[J/MNRAS/408/1494](#) : Planetary transits of TrES-2 and TrES-3 (Colon+, 2010)
[J/AJ/145/68](#) : Five new transit light curves of TrES-3 (Jiang+, 2013)

Byte-by-byte Description of file: [list.dat](#)

Bytes	Format	Units	Label	Explanations
1- 2	A2	---	Band	[UBVI z'] Observed band
4- 10	A7	---	PSys	[Johnson Sloan] Photometric system of the Band
12- 17	A6	---	Inst	Instrument
19- 28	A10	"date"	Obs.Date	Observation date
30- 32	I3	s-1	Cad	Cadence

34-	36	I3	---	Nobs	Number of data points
38-	41	F4.2	mmag-1	rms	Dispersion of the residuals as root mean square (rms) of the observations after subtracting a transit model
43-	54	A12	---	FileName	Name of the table with photometry in subdirectory phot

Byte-by-byte Description of file: [phot/*](#)

Bytes	Format	Units	Label	Explanations
3- 24	E22.17	d	BJD	Barycentric corrected modified Julian date (UTC, BJD-2400000)
29- 39	E11.6	mag	dmag	Differential magnitude
42- 52	E11.6	mag	e_dmag	Error of dmag
56- 66	E11.6	pix	xposT	Target x position on CCD
70- 80	E11.6	pix	yposT	Target y position on CCD
84- 94	E11.6	---	FWHMT	FWHM of target
98-108	E11.6	---	FluxT	Flux of the target

Byte-by-byte Description of file: [vamos\[bv\].dat](#)

Bytes	Format	Units	Label	Explanations
3- 24	E22.17	d	JD	Julian date in UTC (JD-2400000)
28- 39	E12.6	---	Flux	Normalized flux
42- 52	E11.6	---	e_Flux	Error of Flux

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Felix Mackebrandt, [mackebrandt\(at\)mps.mpg.de](mailto:mackebrandt(at)mps.mpg.de)

(End) Felix Mackebrandt [MPS, Germany], Patricia Vannier [CDS] 27-Sep-2017

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