J/A+A/575/L15 TrES-4b RV and Ic curves (Sozzetti+, 2015)

The GAPS programme with HARPS-N at TNG. VI. The curious case of TrES-4b.
Sozzetti A., Bonomo A.S., Biazzo K., Mancini L., Damasso M., Desidera S., Gratton R., Lanza A.F., Poretti E., Rainer M., Malavolta L., Affer L., Barbieri M., Bedin L.R., Boccato C., Bonavita M., Borsa F., Ciceri S., Claudi R.U., Gandolfi D., Giacobbe P., Henning T., Knapic C., Latham D.W., Lodato G., Maggio A., Maldonado J., Marzari F., Martinez Fiorenzano A.F., Micela G., Molinari E., Mordasini C., Nascimbeni V., Pagano I., Pedani M., Pepe F., Piotto G., Santos N., Scandariato G., Shkolnik E., Southworth J.
<Astron. Astrophys., 575, L15-15 (2015)>
=2015A&A...575L..15S

ADC_Keywords: Stars, double and multiple ; Planets ; Photometry ; Radial velocities
Keywords: stars: individual: TrES-4b - planetary systems - techniques: radial velocities - techniques: spectroscopic - techniques: photometric

Abstract:
We update the TrES-4 system parameters using high-precision HARPS-N radial-velocity measurements and new photometric light curves. A combined spectroscopic and photometric analysis allows us to determine a spectroscopic orbit with a semi-amplitude K=51±3m/s. The derived mass of TrES-4b is found to be M_p=0.49±0.04M_{Jup}, significantly lower than previously reported. Combined with the large radius (R_p=1.84$_{-0.09}^{+0.08}$$R_{Jup}$) inferred from our analysis, TrES-4b becomes the transiting hot Jupiter with the second-lowest density known. We discuss several scenarios to explain the puzzling discrepancy in the mass of TrES-4b in the context of the exotic class of highly inflated transiting giant planets.

Description:
The TrES-4 system was observed with HARPS-N on 17 individual epochs between March 2013 and July 2014.
We carried out Ic-band precision photometric observations of two complete transit events of TrES-4 b with the CAHA 1.23-m on UT 2013 July 6 and UT 2014 June 30.

Objects:

RA (2000)	DE	Designation(s)
17 53 13.06	+37 12 42.4	TrES-4b = NAME TrES-4b

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table1.dat	39	17	HARPS-N systemic radial velocities, formal errors, bisector spans, and chromospheric activity index of TrES-4
table3.dat	29	454	Differential photometry of TrES-4 (Ic band, CAHA 1.23-m)

See also:
J/A+A/554/A28 : Qatar-1 differential light curve (Covino+, 2013)
J/A+A/575/A111 : GAPS. V: Global analysis of the XO-2 system (Damasso+, 2015)

Byte-by-byte Description of file: table1.dat

Bytes	Format	Units	Label	Explanations
1- 11	F11.6	d	BJD	Barycentric JD for the midpoint of observation (TDB) (BJD-2450000)
13- 19	F7.3	km/s	gamma	Systemic radial velocity γ
21- 25	F5.3	km/s	e_gamma	rms uncertainty on gamma
27- 32	F6.3	km/s	BS	Bisector Span
34- 39	F6.3	[-]	logR'HK	[-5.4/-5.0] Chromospheric activity index

Byte-by-byte Description of file: table3.dat

Bytes	Format	Units	Label	Explanations
1- 11	F11.6	d	BJD	Barycentric JD for the midpoint of observation (TDB) (BJD-2450000)

```
  13- 20  F8.6  ---     Rflux     [0.9875/1.0021] Relative Ic flux
  22- 29  F8.6  ---     e_Rflux   [[0.0007/0.0009] rms uncertainty on mag
```

History:
From electronic version of the journal

References:

Covino et al., Paper I 2013A&A...554A..28C, Cat. J/A+A/554/A28
Desidera et al., Paper II 2013A&A...554A..29D
Esposito et al., Paper III 2014A&A...564L..13E
Desidera et al., Paper IV 2014A&A...567L...6D
Damasso et al., Paper VII 2015A&A...575A.111D, Cat. J/A+A/575/A111

(End) Patricia Vannier [CDS] 03-Jun-2015

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