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<b>Authors</b>	Perger, M.; Garcia-Piquer, A.; Ribas, I.; Morales, J. C.; AFFER, Laura; et al.
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**J/A+A/598/A26** HADES RV Programme with HARPS-N at TNG. II. (Perger+, 2017)

The HADES RV Programme with HARPS-N at TNG.

**II. Data treatment and simulations.**

Perger M., García-Piquer A., Ribas I., Morales J.C., Affer L., Micela G., Damasso M., Suarez-Mascareño A., Gonzalez-Hernandez J.I., Rebolo R., Herrero E., Rosich A., Lafarga M., Bignamini A., Sozzetti A., Claudi R., Cosentino R., Molinari E., Maldonado J., Maggio A., Lanza A.F., Poretti E., Pagano I., Desidera S., Gratton R., Piotto G., Bonomo A.S., Martínez Fiorenzano A.F., Giacobbe P., Malavolta L., Nascimbeni V., Rainer M., Scandariato G.  
 <Astron. Astrophys. 598, A26 (2017)>  
 =[2017A&A...598A..26P](#) (SIMBAD/NED BibCode)

**ADC\_Keywords:** Surveys ; Spectroscopy ; Stars, M-type; Stars, nearby ;  
 Radial velocities

**Keywords:** methods: statistical - techniques: radial velocities - surveys -  
 stars: low-mass - planetary systems

**Abstract:**

The distribution of exoplanets around low-mass stars is still not well understood. Such stars, however, present an excellent opportunity for reaching down to the rocky and habitable planet domains. The number of current detections used for statistical purposes remains relatively modest and different surveys, using both photometry and precise radial velocities, are searching for planets around M dwarfs. Our HARPS-N red dwarf exoplanet survey is aimed at the detection of new planets around a sample of 78 selected stars, together with the subsequent characterization of their activity properties. Here we investigate the survey performance and strategy. From 2700 observed spectra, we compare the radial velocity determinations of the HARPS-N DRS pipeline and the HARPS-TERRA code, calculate the mean activity jitter level, evaluate the planet detection expectations, and address the general question of how to define the strategy of spectroscopic surveys in order to be most efficient in the detection of planets. We find that the HARPS-TERRA radial velocities show less scatter and we calculate a mean activity jitter of 2.3m/s for our sample. For a general radial velocity survey with limited observing time, the number of observations per star is key for the detection efficiency. In the case of an early M-type target sample, we conclude that approximately 50 observations per star with exposure times of 900s and precisions of approximately 1m/s maximizes the number of planet detections.

**Description:**

Intrinsic and observational characteristics of the 78 target stars of our sample sorted by number of observations (Nobs). We show the absolute RVs and their rms and the mean uncertainties dRV of every object for TERRA (T) and YABI (Y) pipelines. V magnitudes are from SIMBAD. Their masses are the average values of targets with the same spectral type.

**File Summary:**

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
<a href="#">table2.dat</a>	88	78	Characteristics of our target stars

**See also:**

[J/A+A/593/A117](#) : Paper I. GJ 3998 RVs, S and Halpha indexes (Affer+, 2016)

**Byte-by-byte Description of file:** [table2.dat](#)

Bytes	Format	Units	Label	Explanations
1- 22	A22	---	Name	Target name
24- 26	I3	---	Nobs	Number of observations
28- 31	A4	---	SpType	Spectral type
33- 36	F4.2	<a href="#">Msun</a>	M	Stellar mass
38- 41	F4.2	<a href="#">Msun</a>	e_M	? Stellar mass uncertainty
43- 47	F5.2	<a href="#">mag</a>	Vmag	Visual magnitude
50- 54	F5.2	<a href="#">km/s</a>	RV	? Absolute radial velocity (YABI)
56- 60	F5.2	<a href="#">m/s</a>	RVTrms	? rms of TERRA radial velocities
62- 65	F4.2	<a href="#">m/s</a>	e_RVT	Mean TERRA radial velocity uncertainty
67- 71	F5.2	<a href="#">m/s</a>	RVYrms	? rms of YABI radial velocities
73- 76	F4.2	<a href="#">m/s</a>	e_RVY	Mean YABI radial velocity uncertainty
78- 82	F5.1	---	S/N	? Signal-to-noise ratio of observation
84- 88	A5	---	Flag	Flag ( <a href="#">1</a> ).

**Note (1):** Notes as follows:

1 = Stars form the subsample for Sec 3.4.

- 2 = Large rms differences between TERRA and DRS/YABI mentioned in Fig. 3
  - 3 = TERRA RV uncertainties estimated
  - 4 = DRS/YABI RV uncertainties estimated
  - 5 = spectral types from SIMBAD
  - 6 = companion by Howard et al. ([2014ApJ...794...51H](#))
  - 7 = companion by Affer et al. ([2016A&A...593A.117A](#))
- 

**Acknowledgements:**

Manuel Perger, [perger\(at\)ice.cat](mailto:perger(at)ice.cat)

**References:**

- |                     |           |   |
|---------------------|-----------|---|
| Affer et al.,       | Paper I   | <a href="#">2016A&amp;A...593A.117A</a> , Cat. <a href="#">J/A+A/593/A117</a> |
| Maldonado et al.,   | Paper III | <a href="#">2017A&amp;A...598A..27M</a>                                       |
| Scandariato et al., | Paper IV  | <a href="#">2017A&amp;A...598A..28S</a>                                       |
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(End) Manuel Perger [CSIC-IEEC, Spain], Patricia Vannier [CDS] 07-Nov-2016

The document above follows the rules of the [Standard Description for Astronomical Catalogues](#); from this documentation it is possible to generate *f77* program to load files [into arrays](#) or [line by line](#)

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