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HD 284149 SPHERE/IFS spectrum

(Bonavita+, 2017)

Orbiting a binary: SPHERE characterisation of the HD 284149 system.

Bonavita M., D'Orazi V., Mesa D., Fontanive C., Desidera S., Messina S., Daemgen S., Gratton R., Vigan A., Zurlo A., Antichi J., Avenhaus H., Baruffolo A., Baudino J.L., Beuzit J.L., Boccaletti A., Bonnefoy M., Bruno P., Cascone E., Chauvin G., Claudi R.U., De Caprio V., Fantinel D., Farisato G., Feldt M., Galicher R., Giro E., Gry C., Hagelberg J., Incorvaia S., Janson M., Jaquet M., Lagrange A.M., Langlois M., Lannier J., Le Coroller H., Lessio L., Ligi R., Maire A.L., Meyer M., Menard F., Perrot C., Peretti S., Petit C., Ramos J., Roux A., Salasnich B., Salter G., Samland M., Scuderi S., Schlieder J., Surez M., Turatto M., Weber L.

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Keywords: stars: individual: HD 284149 - brown dwarfs - binaries: visual - stars: rotation - techniques: high angular resolution

Abstract:

In this paper we present the results of the SPHERE observation of the HD 284149 system, aimed at a more detailed characterisation of both the primary and its brown dwarf companion.

We observed HD 284149 in the near-infrared with SPHERE, using the imaging mode (IRDIS+IFS) and the long-slit spectroscopy mode (IRDIS-LSS). The data were reduced using the dedicated SPHERE pipeline, and algorithms such as PCA and TLOCI were applied to reduce the speckle pattern.

The IFS images revealed a previously unknown low-mass ($\sim 0.16 M_{\odot}$) stellar companion (HD 284149 B) at $\sim 0.1''$, compatible with previously observed radial velocity differences, as well as proper motion differences between Gaia and Tycho-2 measurements. The known brown dwarf companion (HD 284149 b) is clearly visible in the IRDIS images. This allowed us to refine both its photometry and astrometry. The analysis of the medium resolution IRDIS long slit spectra also allowed a refinement of temperature and spectral type estimates. A full reassessment of the age and distance of the system was also performed, leading to more precise values of both mass and semi-major axis.

As a result of this study, HD 284149 ABb therefore becomes the latest addition to the (short) list of brown dwarfs on wide circumbinary orbits, providing new evidence to support recent claims that object in such configuration occur with a similar frequency to wide companions to single stars.

Description:

HD 284149 was observed with SPHERE in IRDIFS mode on 2015-10-25 and with IRDIFS_EXT mode on 2015-11-27 as part of the SHINE (SpHere INfrared survey for Exoplanet) GTO campaign.

Objects:

RA	(2000)	DE	Designation(s)
04 06 38.80	+20 18 11.1		HD 284149 = V* V1300 Tau

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
spectra.dat	34	39	HD 284149 B IFS spectrum

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

Bytes	Format	Units	Label	Explanations
1- 8	F8.6	um	lambda	Wavelength
11- 21	E11.6	W/m2/um	Flux	Flux
24- 34	E11.6	W/m2/um	e_Flux	rms uncertainty on Flux

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(End)

Patricia Vannier [CDS]

11-Dec-2017

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