



14117 - A Young White Dwarf with an Infrared Excess: Dust Disk or Substellar Companion?

Cycle: 23, Proposal Category: GO
(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) PG0010+280	COS/FUV	1	21-Jul-2015 21:43:42.0	yes

1 Total Orbits Used

ABSTRACT

We recently discovered the youngest white dwarf with 2-8 micron emission. Its SED can be fit by either a dust disk or a substellar companion. Two unique properties of this object favor the substellar companion hypothesis: (i) the color of the infrared excess; (ii) the non-detection of heavy elements with Keck/HIRES observations. We propose to use COS to look for heavy elements; which would be about two orders of magnitude more sensitive than the HIRES studies. If heavy elements are detected, the excess emission is likely to come from dust and this would be the hottest white dwarf with a ~1200 K dust disk; otherwise, the excess is likely to come from a substellar companion, possibly a rejuvenated planet, which would rank among the closest and lowest mass companions known to orbit a white dwarf.

OBSERVING DESCRIPTION

Our goal is to look for heavy elements in the atmosphere of PG 0010+280 to understand the origin of its infrared excess. The strongest photospheric line comes from silicon, including Si II 1265 A, Si III 1299 A and Si IV 1392 A.

We will employ the G130M grating with a central wavelength of 1291 A and a wavelength coverage of 1137-1274 A and 1292-1432 A. Extrapolating from the GALEX flux, we found that an average S/N of 45 can be reached with an exposure time of 2200 sec (1 orbit) according to the ETC. To minimize the fixed-pattern noise, all four FP-POS steps are used.

Proposal 14117 - Visit 01 - A Young White Dwarf with an Infrared Excess: Dust Disk or Substellar Companion?

Wed Jul 22 01:43:43 GMT 2015

Visit	Proposal 14117, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: COS/FUV Special Requirements: (none)									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	PG0010+280	RA: 00 13 21.0390 (3.3376625d) Dec: +28 20 19.89 (28.33886d) Equinox: J2000	Proper Motion RA: 2.1 mas/yr Proper Motion Dec: -13.0 mas/yr Epoch of Position: 2000	V=15.7	Reference Frame: ICRS				
	<i>Comments: Extended=NO</i>									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ/SEAR CH (COS.ta.716 846)	(1) PG0010+280	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-W T-FLR; SCAN-SIZE=3; SEGMENT=BOTH			1 Secs (1 Secs) [==>]	[1]
	2	ACQ/PEAK XD (COS.sa.716 853)	(1) PG0010+280	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	SEGMENT=BOTH			1 Secs (1 Secs) [==>]	[1]
	3	ACQ/PEAK D (COS.sa.716 853)	(1) PG0010+280	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	CENTER=FLUX-W T-FLR; NUM-POS=5; SEGMENT=BOTH; STEP-SIZE=0.9			1 Secs (1 Secs) [==>]	[1]
	4	PG0010+28 0 (COS.sp.716 844)	(1) PG0010+280	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=33 0; FLASH=YES; FP-POS=ALL; SEGMENT=BOTH			439 Secs (1761 Secs) [==>441.0 Secs (Split 1)] [==>440.0 Secs (Split 2)] [==>440.0 Secs (Split 3)] [==>440.0 Secs (Split 4)]	[1]

