13356 - A Candidate Gravitationally Lensed Quasar at z=6.09

Cycle: 21, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SDSSJ160253.9+422824	ACS/WFC	1	11-Jul-2013 17:09:38.0	yes
02	(1) SDSSJ160253.9+422824	WFC3/IR	1	11-Jul-2013 17:09:48.0	yes

2 Total Orbits Used

ABSTRACT

We have obtained WFC3/IR images of nearly half of the known quasars at z~6 through a Cycle 18 SNAP program. During the latter part of the Cycle we identified a candidate gravitationally lensed quasar, SDSSJ1602+4228, at z=6.09. The short duration SNAP exposure shows that the central arcsecond is resolved into multiple emission features, which we interpret as two lensed images of the z=6 quasar and the lens galaxy. However, from the single band image the nature of the components is inconclusive. We propose a brief (two orbit) follow-up program that will include imaging in three bands: WFC3/IR Y and H, and ACS/WFC R-band. The combination of infrared and optical imaging will allow us to use color information to

isolate the quasar images, lens galaxy, or any contaminating foreground objects. The confirmation of even one lensed quasar among the SNAP sample has strong implications for the shape of the quasar luminosity function at z=6, with further implications for expected source counts at higher redshift, as well as models for black hole growth in the early Universe.

OBSERVING DESCRIPTION

J1602+4228 is a z=6.09 quasar that is a candidate gravitational lens based on the morphology of a WFC3 SNAP image obtained in Cycle 18. The SNAP image shows a bright PSF component associated with the known quasar, as well as a putative secondary PSF component and extended emission on ~1" scales. This program will test the lensing hypothesis for this object by using optical and infrared color information to discriminate foreground objects from those at the redshift of the quasar.

One orbit with WFC3/IR will be split between F105W and F160W. The observations will use optimal dithering with a 4-pt box pattern and the WFC3 IR aperture. The integrations in each band are 7xSPARS50 for 350s at each dither point. A second orbit will use ACS/WFC with the F606W filter, and will similarly employ a 4-pt box pattern with 567s individual exposure times.

Visit

Proposal 13356, Visit 01

Thu Jul 11 21:09:56 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1)

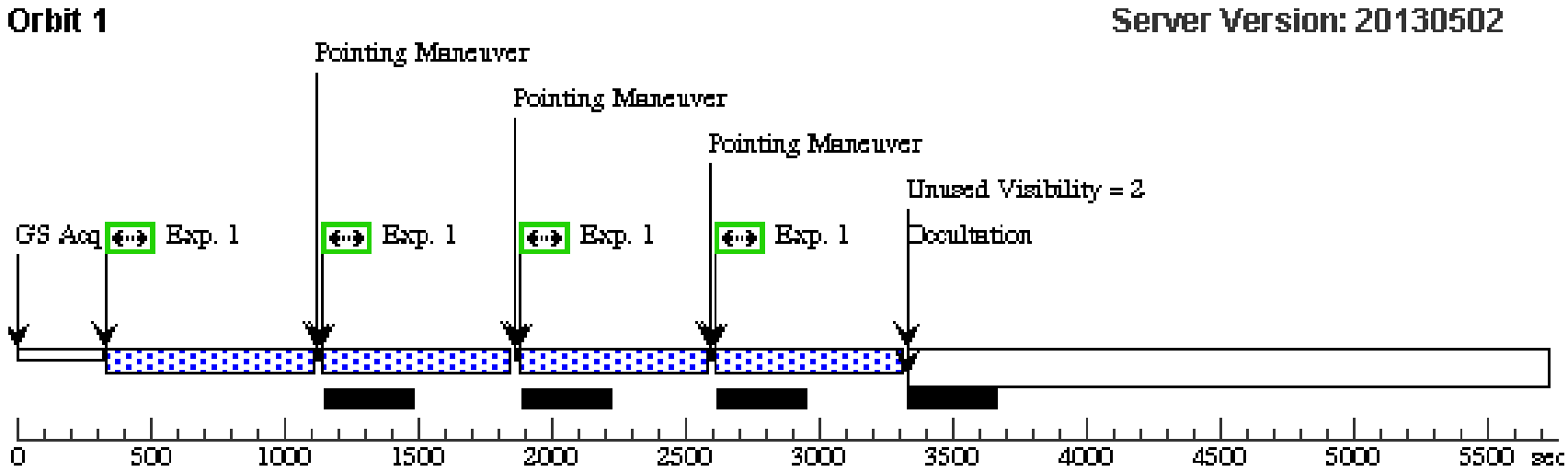
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SDSSJ160253.9+422824	RA: 16 02 53.9800 (240.7249167d) Dec: +42 28 24.80 (42.47356d) Equinox: J2000		V=(?) z(AB)=19.9	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SDSSJ160253.9+422824	ACS/WFC, ACCUM, WFC	F606W			Pattern 1, Exps 1-1 in Visit 01 (1)	576 Secs (2304 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 13356, Visit 02 Thu Jul 11 21:09:58 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SDSSJ160253.9+422824	RA: 16 02 53.9800 (240.7249167d) Dec: +42 28 24.80 (42.47356d) Equinox: J2000		V=(?) z(AB)=19.9	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SDSSJ160253.9+422824	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=7; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in Visit 02 (2)	302.934997 Secs (1211.74 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(1) SDSSJ160253.9+422824	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=7; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in Visit 02 (2)	302.934997 Secs (1211.74 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure