17875 - SPT-CLJ2223-5015: RUNAWAY COOLING IN THE ABSENCE OF FEEDBACK?

Cycle: 32, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Prof. Michael A. McDonald (PI) (Contact)	**Massachusetts Institute of Technology**
Dr. William R. Forman (CoI)	Smithsonian Institution Astrophysical Observatory
Dr. Taweewat Somboonpanyakul (CoI)	Chulalongkorn University
Michael S. Calzadilla (CoI)	Smithsonian Institution Astrophysical Observatory
Dr. Adam Mantz (CoI)	Stanford University
Prof. Julie Hlavacek-Larrondo (CoI) (CSA Member)	Universite de Montreal
Dr. Charles Romero (CoI)	Green Bank Observatory
Dr. Benjamin Floyd (CoI) (ESA Member)	University of Portsmouth
Prof. Massimo Gaspari (CoI) (ESA Member)	University of Modena and Reggio Emilia
Dr. Matthias Klein (CoI) (ESA Member)	Universitats-Sternwarte Munchen
Anthony M Flores (CoI)	Stanford University
Prof. Steven W. Allen (CoI)	Stanford University
Dr. Lindsey Bleem (CoI)	Argonne National Laboratory

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SPT-CLJ2223-5015	WFC3/UVIS	1	07-Nov-2024 12:00:28.0	yes
02	(1) SPT-CLJ2223-5015	WFC3/IR	1	07-Nov-2024 12:00:29.0	yes

2 Total Orbits Used

ABSTRACT

We propose short Chandra (45ks) and Hubble (2 orbits) observations of a unique galaxy cluster, SPT-CLJ2223-5015. This cluster, at z=0.24, hosts a massive starburst at its center, with a star formation rate (50-130 Msun/yr) on par with the central galaxy in Abell 1835. Even more interesting, this central starburst galaxy appears to be radio quiet, with a radio luminosity 200x fainter than necessary to prevent runaway cooling of the ICM. Combining the proposed Chandra+Hubble data with approved ground-based spectroscopy, we will confirm that (i) the starburst galaxy lies in the center of the cluster, (ii) that the cluster is a strong cool core, and (iii) that the starburst is being fueled by runaway cooling of the ICM, in the absence of any radio-mode feedback.

OBSERVING DESCRIPTION

The goal of this program is to obtain single-band imaging with WFC3-UVIS and WFC3-IR, using the F475W and F110W filters, respectively.

Visit

Proposal 17875, Visit 01 Thu Nov 07 17:00:29 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

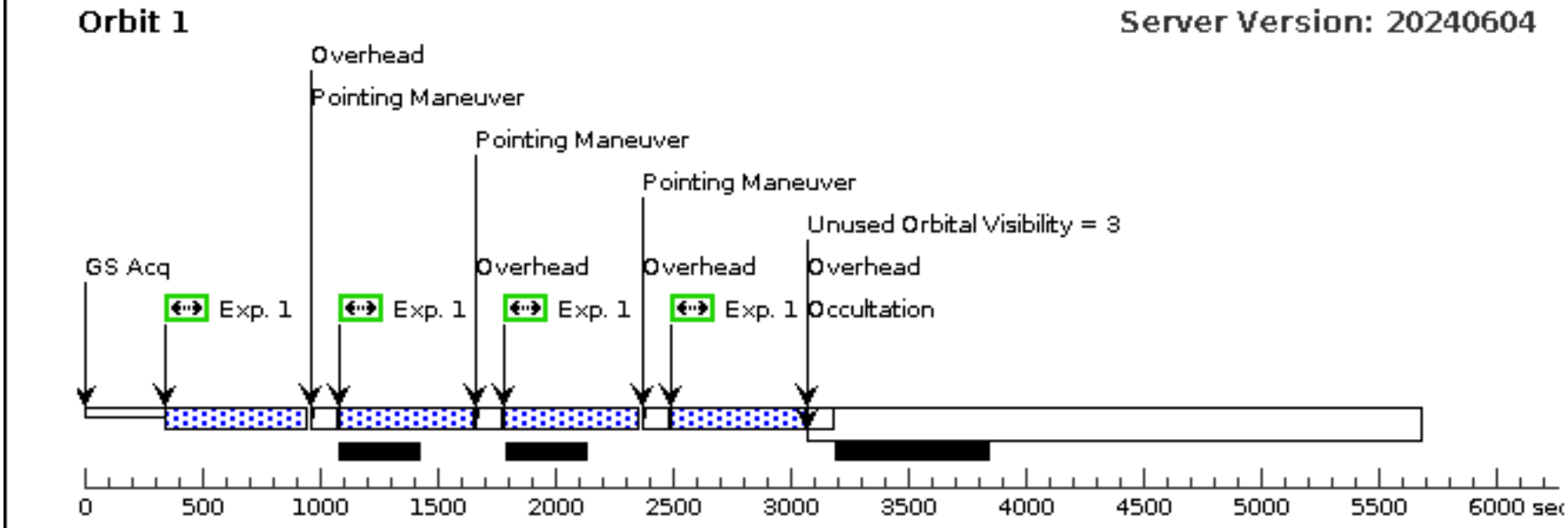
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SPT-CLJ2223-5015	RA: 22 23 19.9547 (335.8331446d) Dec: -50 15 57.17 (-50.26588d) Equinox: J2000		V=16	Reference Frame: ICRS

Comments:
Category=CLUSTER OF GALAXIES
Description=[COOLING FLOW, EMISSION LINE NEBULA, RICH CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SPT-CLJ2223-5015	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=5		Pattern 1, Exps 1-1 in Visit 01 (1)	500 Secs (2288 Secs) *[==>572.0 Secs (Pattern 1)]* *[==>572.0 Secs (Pattern 2)]* *[==>572.0 Secs (Pattern 3)]* *[==>572.0 Secs (Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 17875, Visit 02 Thu Nov 07 17:00:29 GMT 2024

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)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SPT-CLJ2223-5015	RA: 22 23 19.9547 (335.8331446d) Dec: -50 15 57.17 (-50.26588d) Equinox: J2000		V=16	Reference Frame: ICRS

Comments:
Category=CLUSTER OF GALAXIES
Description=[COOLING FLOW, EMISSION LINE NEBULA, RICH CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SPT-CLJ2223-5015	WFC3/IR, MULTIACCUM, IR	F110W	SAMP-SEQ=STEP100; NSAMP=12		Pattern 2, Exps 1-1 in Visit 02 (2)	599.232292 Secs (2396.929 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure