17890 - The HI properties of low-z Green Pea galaxies

Cycle: 32, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. Nissim Kanekar (PI) (Contact)	**National Centre for Radio Astrophysics, TIFR**
Dr. Sangeeta Malhotra (CoI)	NASA Goddard Space Flight Center
Dr. James Rhoads (CoI) (AdminUSPI)	NASA Goddard Space Flight Center
Dr. John Pharo (CoI) (ESA Member)	Leibniz-Institut für Astrophysik Potsdam (AIP)
Mr. Archishman Khasnovis (CoI)	National Centre for Radio Astrophysics, TIFR
Isak Wold (CoI)	Catholic University of America

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) J0825+1846	COS/FUV COS/NUV	1	20-Dec-2024 09:00:47.0	yes
02	(2) J0942+4110	COS/FUV COS/NUV	1	20-Dec-2024 09:00:48.0	yes
03	(3) J1411+0556	COS/FUV COS/NUV	1	20-Dec-2024 09:00:48.0	yes
04	(4) J1444+0409	COS/FUV COS/NUV	1	20-Dec-2024 09:00:49.0	yes

4 Total Orbits Used

ABSTRACT

Green Pea galaxies (GPs) are low-mass, extreme starburst systems in the nearby Universe, with powerful emission lines, including forbidden [OIII] lines, that rival the stellar continuum in luminosity. GPs with high values of O32, the ratio of the [OIII]5007 line luminosity to the [OII]3727 line luminosity, are expected to be the best analogs of the high-redshift galaxies that reionized the Universe, with a number of such GPs showing high leakage of ionizing photons. Recent Arecibo and GBT studies have detected 21cm emission from ~60% of the GPs with O32<10, they only obtained 21cm non-detections from GPs with O32>10. We propose to use the VLA to carry out deep 21cm spectroscopy of 8 GPs with z<0.05 and O32>10, to measure their HI masses, HI-to-stellar mass ratios, and HI depletion timescales. We also propose to obtain HST-COS far-UV spectroscopy covering the Lyman-alpha line and the metal lines of four of the 8 GPs, which do not currently have HST-COS spectroscopy, to infer the Ly-alpha escape fraction, the HI column density and the HI filling factor, and compare these to the HI properties inferred from the VLA 21cm images. We request 78 L-band hours in C-array, and four HST-COS orbits for this proposal.

OBSERVING DESCRIPTION

One orbit of COS spectroscopy on each of four Green Peas for which VLA time was allocated, and for which no prior COS spectroscopy exists.

Visit

Proposal 17890, Visit 01 Fri Dec 20 14:00:49 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Visit 01)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

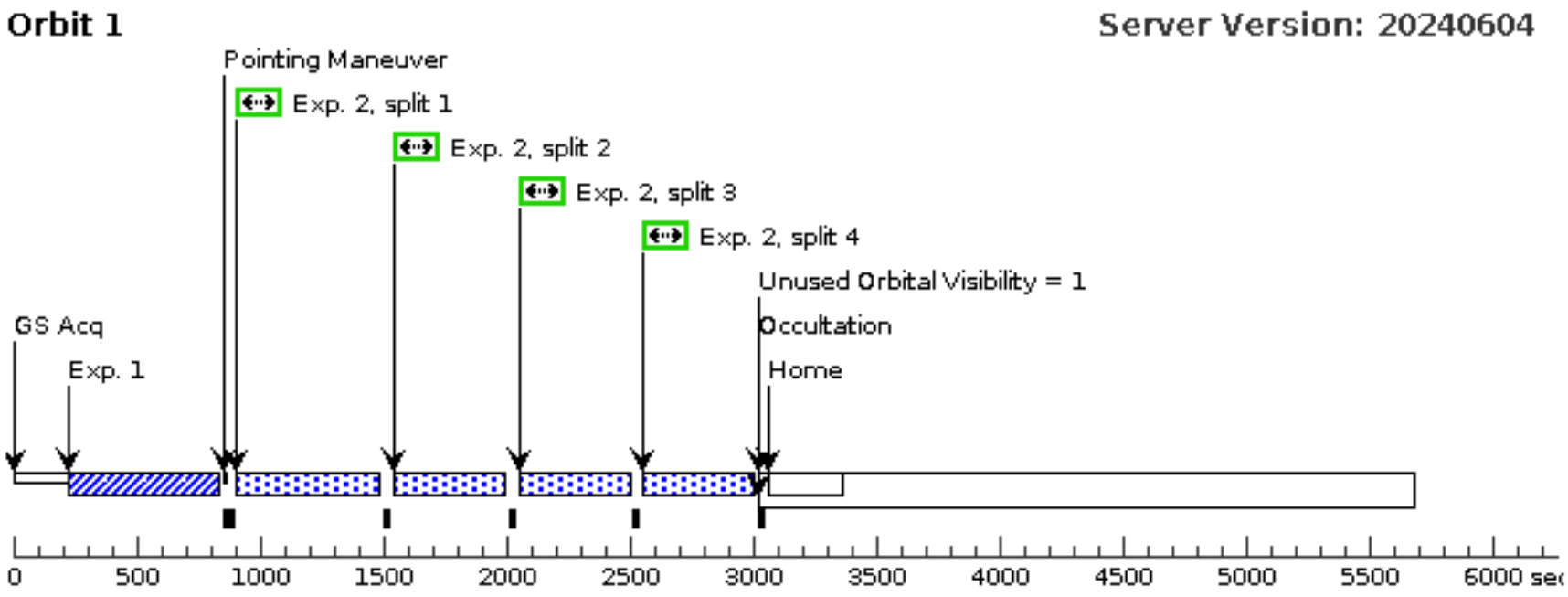
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	J0825+1846	RA: 08 25 40.4500 (126.4185417d) Dec: +18 46 17.20 (18.77144d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0	V=18.0	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[DWARF COMPACT, EMISSION LINE NEBULA, STARBURST]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1401220)	(1) J0825+1846	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				200 Secs (200 Secs) *[==>]*	 ***[1]***
2	(COS.sp.1401203)	(1) J0825+1846	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=14291			400 Secs (1600 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17890, Visit 02 Fri Dec 20 14:00:49 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Visit 02)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

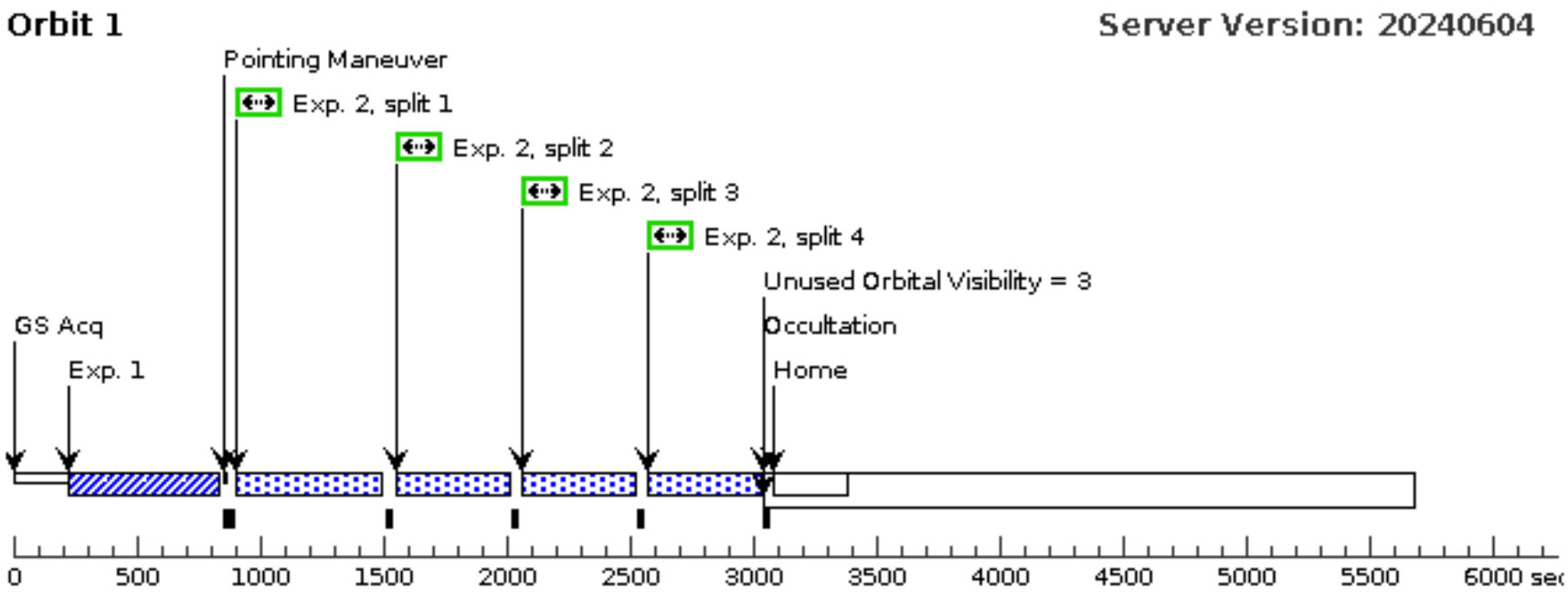
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	J0942+4110	RA: 09 42 44.2400 (145.6843333d) Dec: +41 10 19.30 (41.17203d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0	V=18.0	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[DWARF COMPACT, EMISSION LINE NEBULA, STARBURST]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1401220)	(2) J0942+4110	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				200 Secs (200 Secs) *[==>]*	 ***[1]***
2	(COS.sp.1401203)	(2) J0942+4110	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=14291			380 Secs (1624 Secs) *[==>406.0 Secs (Split 1)]* *[==>406.0 Secs (Split 2)]* *[==>406.0 Secs (Split 3)]* *[==>406.0 Secs (Split 4)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17890, Visit 03 Fri Dec 20 14:00:49 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Visit 03)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

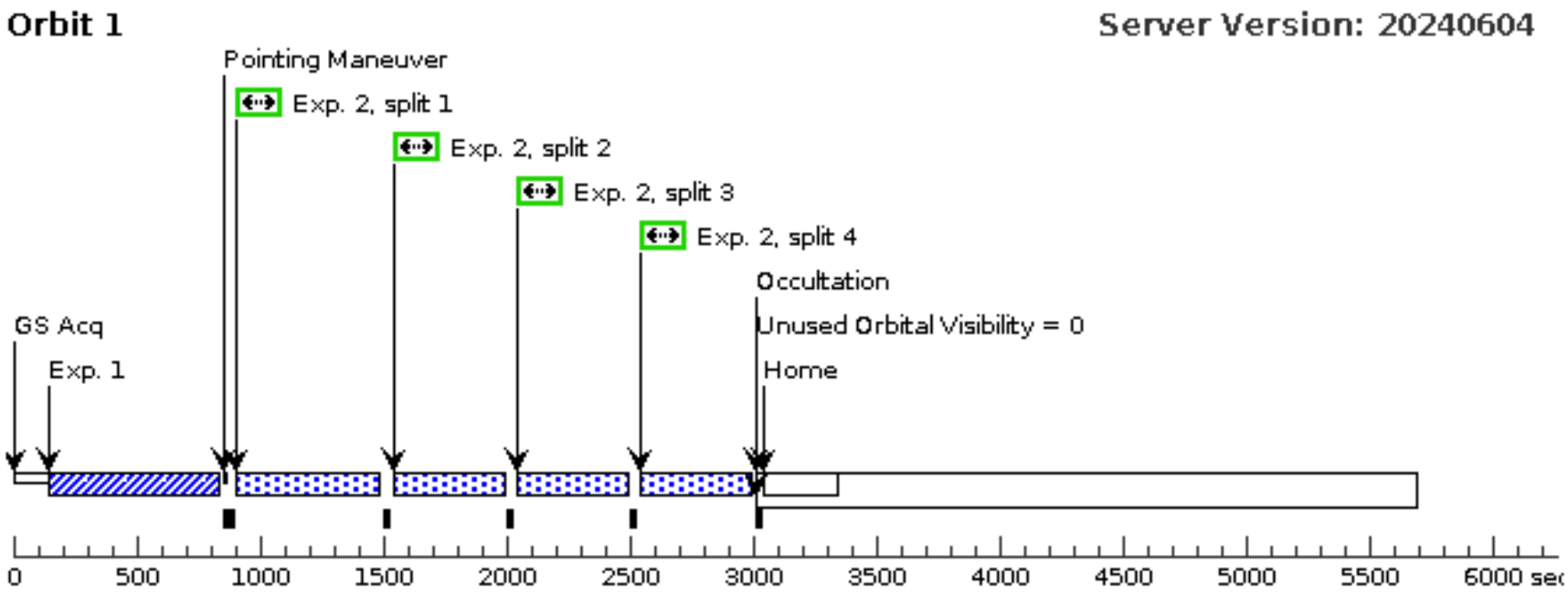
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	J1411+0556	RA: 14 11 13.3900 (212.8057917d) Dec: +05 50 35.20 (5.84311d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0	V=18.0	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[DWARF COMPACT, EMISSION LINE NEBULA, STARBURST]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1401220)	(3) J1411+0556	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				200 Secs (200 Secs)	
								[==>]	***[1]***
2	(COS.sp.1401203)	(3) J1411+0556	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=14291			397 Secs (1588 Secs)	
								[==>(Split 1)] *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	***[1]***

Orbit Structure



Visit

Proposal 17890, Visit 04 Fri Dec 20 14:00:50 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: (none)

Diagnostics

(Exposure 2 (Visit 04)) Warning (Form): COS FUV PSA science exposures with extended targets have special calibration limitations. See "Errors and Warnings" for more details.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	J1444+0409	RA: 14 44 41.3700 (221.1723750d) Dec: +04 09 41.70 (4.16158d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0	V=18.0	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[DWARF COMPACT, EMISSION LINE NEBULA, STARBURST]
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(COS.ta.1401220)	(4) J1444+0409	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				200 Secs (200 Secs)	
								[==>]	***[1]***
2	(COS.sp.1401203)	(4) J1444+0409	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=14291			395 Secs (1580 Secs)	
								[==>(Split 1)] *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	***[1]***

Orbit Structure