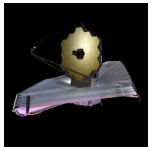

1230 - The Physics of Brown Dwarfs - Part #3

Cycle: 1, Proposal Category: GTO

INVESTIGATORS

Name	*Institution*	*E-Mail*
Catarina Alves de Oliveira (PI) (ESA Member)	**ESA-European Space Astronomy Centre**	**catarina.alves@esa.int**
Dr. Pierre Ferruit (CoI) (ESA Member)	ESA-European Space Astronomy Centre	pierre.ferruit@esa.int
Dr. Thomas L Roellig (CoI)	NASA Ames Research Center	thomas.l.roellig@nasa.gov
Dr. Loic Albert (CoI) (CSA Member)	Universite de Montreal	albert@astro.umontreal.ca
Prof. David Barrado Navascues (CoI) (ESA Member)	Centro de Astrobiologia (CSIC/INTA) Inst. Nac. de Tec. Aero.	barrado@cab.inta-csic.es
Dr. Jeff A. Valenti (CoI) (US Admin CoI)	Space Telescope Science Institute	valenti@stsci.edu
Prof. Kevin Luhman (CoI)	The Pennsylvania State University	kluhman@astro.psu.edu
Dr. Pascal Tremblin (CoI) (ESA Member)	Commissariat a l'Energie Atomique (CEA)	pascal.tremblin@gmail.com
Dr. Isabelle Baraffe (CoI) (ESA Member)	University of Exeter	i.baraffe@exeter.ac.uk
Dr. Gilles Chabrier (CoI) (ESA Member)	Ecole Normale Superieure de Lyon	chabrier@ens-lyon.fr
Dr. Richard Parker (CoI) (ESA Member)	University of Sheffield	r.parker@sheffield.ac.uk

OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
NIRSpec observations (PI: Dr. Catarina Alves de Oliveira)				
	1	PRISM and G395M spectroscopy	NIRSpec Fixed Slit Spectroscopy	(1) WISE0855-0714
REPEAT - NIRSpec observations (PI: Dr. Catarina Alves de Oliveira)				
	7	PRISM and G395M spectroscopy	NIRSpec Fixed Slit Spectroscopy	(1) WISE0855-0714
NIRCam observations (PI: Dr. Thomas L Roellig)				
	2	NIRCam Filters First Visit	NIRCam Imaging	(1) WISE0855-0714

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	3	NIRCam Filters Second Visit	NIRCam Imaging	(1) WISE0855-0714
NIRISS observations (PI: Dr. Loic Albert)				
	4	NIRISS/AMI	NIRISS Aperture Masking Interferometry	(1) WISE0855-0714
	6	NIRISS/AMI Ref	NIRISS Aperture Masking Interferometry	(2) UGPSJ072227.51-054031.2
REPEAT - NIRISS observations (PI: Dr. Loic Albert)				
	8	NIRISS/AMI	NIRISS Aperture Masking Interferometry	(1) WISE0855-0714
	9	NIRISS/AMI Ref	NIRISS Aperture Masking Interferometry	(2) UGPSJ072227.51-054031.2
MIRI observations (PI: Dr. David Barrado y Navascues)				
	5	MIRI MRS	MIRI Medium Resolution Spectroscopy	(1) WISE0855-0714

ABSTRACT

Brown dwarfs represent a sizeable fraction of the stellar content of the Galaxy and their masses populate the transition between the stellar and planetary mass regime. There is not an accepted explanation on how they form, making them a key element in understanding the origin of stellar masses and their distribution. As brown dwarfs evolve and cool down, their atmospheres resemble those of gas giant extrasolar planets, providing easier targets to observe and investigate the physical and chemical processes in low-temperature atmospheres. The new observational frontier is therefore the discovery and spectral characterization of the coldest and least massive brown dwarfs to test formation theories and advance the physics of cool atmospheres.

This is the main driver behind the NIRSpec part of this proposal, where we will perform low and medium resolution slit spectroscopy of WISE 08550714, the coldest known brown dwarf (250 K), which is also the Sun’s 4th closest neighbour, to test model atmospheres at very low temperatures.

Additionally, the NIRCam, NIRISS, and MIRI GTO teams will also observe WISE 0855-0714 (please refer to their GTO program description for a science justification).

NIRSpec proposal ID: R65.00

OBSERVING DESCRIPTION

NIRSpec: We will acquire low and medium resolution spectroscopy with the S200A1 slit and the PRISM/CLEAR and G395M/F290LP configurations.

Scientific justification for requesting that observations are executed in a non-interruptible sequence:
WISE0855 is known to be a variable brown dwarf (e.g., Esplin+2016). Acquiring these JWST observations in a non-interruptible sequence is the only available solution to minimize the uncertainties the variability causes when comparing the observations to atmospheric models and reach a coherent interpretation of its atmosphere, which is the main goal of this program.

[Deprecated]The proposal target has a very high proper motion (~8/year), and its position in 2019 can be predicted with an accuracy of only 40 mas given the best available measurements of its proper motion and parallax. That accuracy is insufficient for NIRSpec target-acquisition with the MSA. We will change the TA method to "WATA" once it becomes available in APT 25.4 .

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d) Dec: -07 14 34.16 (-7.24282d) Equinox: J2000	Proper Motion RA: -8118.396 mas/yr Proper Motion Dec: 680.546 mas/yr Parallax: 0.448528" Epoch of Position: 2022.9	
Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5"). We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022. Category=Star Description=[Y dwarfs] Extended=NO				
(2)	UGPSJ072227.51-054031.2	RA: 07 22 27.2788 (110.6136617d) Dec: -05 40 29.81 (-5.67495d) Equinox: J2000	Proper Motion RA: -904.14 mas/yr Proper Motion Dec: 352.03 mas/yr Parallax: 0.2428" Epoch of Position: 2010.8290486	
Comments: Used a calibrator source of similar spectral type as our science target W0855 to do the kernel phase analysis. Category=Star Description=[Brown dwarfs] Extended=NO				

Observation

Proposal 1230, Observation 1: PRISM and G395M spectroscopy Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit Spectroscopy

Comments: The proposal target has a very high proper motion (~8/year), and its position in 2019 can be predicted with an accuracy of only 40 mas given the best available measurements of its proper motion and parallax. That accuracy is insufficient for NIRSpec target-acquisition with the MSA. We will change the TA method to "WATA" once it becomes available in APT 25.4 .

Diagnostics

(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d)	Proper Motion RA: -8118.396 mas/yr	
		Dec: -07 14 34.16 (-7.24282d)	Proper Motion Dec: 680.546 mas/yr	
		Equinox: J2000	Parallax: 0.448528"	
			Epoch of Position: 2022.9	

Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5").
We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022.
Category=Star
Description=[Y dwarfs]
Extended=NO

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	WATA	SUB32	CLEAR	NRSRAPID	3	1	1	0.08	11911

Template

Slit	Subarray
S200A1	SUBS200A1

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	3	NONE

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	S200A1	NRSRAPID	840	1	1	NONE	3	3	3930.895	
2	PRISM/CLEAR	S200A1	NRSRAPID	1083	3	2	NONE	3	9	15200.032	

Special Requirements	Sequence Observations 1, 2, 4, 6, Non-interruptible

Observation

Proposal 1230, Observation 7: PRISM and G395M spectroscopy

Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit Spectroscopy

Diagnostics

(Visit 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d) Dec: -07 14 34.16 (-7.24282d) Equinox: J2000	Proper Motion RA: -8118.396 mas/yr Proper Motion Dec: 680.546 mas/yr Parallax: 0.448528" Epoch of Position: 2022.9	

Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5").
We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022.
Category=Star
Description=[Y dwarfs]
Extended=NO

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	WATA	SUB2048	CLEAR	NRSRAPID	3	1	1	3.628	11911

Template

Slit	Subarray
S200A1	SUBS200A1

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	3	NONE

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	S200A1	NRSRAPID	840	1	1	NONE	3	3	3930.895	
2	PRISM/CLEAR	S200A1	NRSRAPID	1083	3	2	NONE	3	9	15200.032	

Special Requirements	Sequence Observations 5, 7, 8, 9, Non-interruptible

Observation

Proposal 1230, Observation 2: NIRCam Filters First Visit Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 2:1) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d) Dec: -07 14 34.16 (-7.24282d) Equinox: J2000	Proper Motion RA: -8118.396 mas/yr Proper Motion Dec: 680.546 mas/yr Parallax: 0.448528" Epoch of Position: 2022.9	

Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5").
We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022.
Category=Star
Description=[Y dwarfs]
Extended=NO

Template

Module	Subarray
B	FULL

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRAMODULEX	4	STANDARD		1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F200W	F444W	SHALLOW4	6	1	4	4	1245.465	

Special Requirements

Offset -20.0 arcsec, -20.0 arcsec

3 After 2 by 150 Days to 210 Days
Sequence Observations 1, 2, 4, 6, Non-interruptible

Observation

Proposal 1230, Observation 3: NIRCam Filters Second Visit Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d) Dec: -07 14 34.16 (-7.24282d) Equinox: J2000	Proper Motion RA: -8118.396 mas/yr Proper Motion Dec: 680.546 mas/yr Parallax: 0.448528" Epoch of Position: 2022.9	

Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5").
We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022.
Category=Star
Description=[Y dwarfs]
Extended=NO

Template

Module	Subarray
B	FULL

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRAMODULEX	4	STANDARD		1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F200W	F444W	SHALLOW4	6	1	4	4	1245.465	

Special Requirements

Offset -20.0 arcsec, -20.0 arcsec

3 After 2 by 150 Days to 210 Days

Observation

Proposal 1230, Observation 4: NIRISS/AMI

Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRISS Aperture Masking Interferometry

Diagnostics

(NIRISS/AMI (Obs 4)) Warning (Form): NGROUPS=1 may suffer from low calibration accuracy.

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d) Dec: -07 14 34.16 (-7.24282d) Equinox: J2000	Proper Motion RA: -8118.396 mas/yr Proper Motion Dec: 680.546 mas/yr Parallax: 0.448528" Epoch of Position: 2022.9	

Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5").
We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022.
Category=Star
Description=[Y dwarfs]
Extended=NO

Acquisition

#	Target	Acquisition Mode	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	AMIFAINT	F480M	NIS	19	1	1	3.524	12113

Template

Subarray	Direct Image
FULL	true

Dithers

#	Primary Dithers	Subpixel Positions
1	NONE	NONE
2	NONE	NONE

Direct Image

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	6	34	1	34	2555.351	

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	1	1	1	1	21.474	

PSF References

Additional Justification: true

Special Requirements

No Parallel Attachments

Sequence Observations 1, 2, 4, 6, Non-interruptible

Observation

Proposal 1230, Observation 6: NIRISS/AMI Ref

Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRISS Aperture Masking Interferometry

Diagnostics

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	UGPSJ072227.51-054031.2	RA: 07 22 27.2788 (110.6136617d)	Proper Motion RA: -904.14 mas/yr	
		Dec: -05 40 29.81 (-5.67495d)	Proper Motion Dec: 352.03 mas/yr	
		Equinox: J2000	Parallax: 0.2428"	
			Epoch of Position: 2010.8290486	

Comments: Used a calibrator source of similar spectral type as our science target W0855 to do the kernel phase analysis.
Category=Star
Description=[Brown dwarfs]
Extended=NO

Acquisition

#	Target	Acquisition Mode	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	2 UGPSJ072227.51-054031.2	AMIFAINT	F480M	NISRAPID	19	1	1	0.93	115390.55

Template

Subarray	Direct Image
SUB80	true

Dithers

#	Primary Dithers	Subpixel Positions
1	NONE	NONE
2	NONE	NONE

Direct Image

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	120	125	1	125	1143.59	115390.54

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	2	1	1	1	0.247	115390.56

PSF References	PSF Reference: true
Special Requirements	No Parallel Attachments Sequence Observations 1, 2, 4, 6, Non-interruptible

Observation

Proposal 1230, Observation 8: NIRISS/AMI

Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRISS Aperture Masking Interferometry

Diagnostics

(NIRISS/AMI (Obs 8)) Warning (Form): NGROUPS=1 may suffer from low calibration accuracy.

(Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d) Dec: -07 14 34.16 (-7.24282d) Equinox: J2000	Proper Motion RA: -8118.396 mas/yr Proper Motion Dec: 680.546 mas/yr Parallax: 0.448528" Epoch of Position: 2022.9	

Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5").
We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022.
Category=Star
Description=[Y dwarfs]
Extended=NO

Acquisition

#	Target	Acquisition Mode	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	AMIFAINT	F480M	NIS	19	1	1	3.524	12113

Template

Subarray	Direct Image
FULL	true

Dithers

#	Primary Dithers	Subpixel Positions
1	NONE	NONE
2	NONE	NONE

Direct Image

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	6	34	1	34	2555.351	

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	1	1	1	1	21.474	

PSF References

Additional Justification: true

Special Requirements

No Parallel Attachments

Sequence Observations 5, 7, 8, 9, Non-interruptible

Observation

Proposal 1230, Observation 9: NIRISS/AMI Ref

Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRISS Aperture Masking Interferometry

Diagnostics

(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	UGPSJ072227.51-054031.2	RA: 07 22 27.2788 (110.6136617d)	Proper Motion RA: -904.14 mas/yr	
		Dec: -05 40 29.81 (-5.67495d)	Proper Motion Dec: 352.03 mas/yr	
		Equinox: J2000	Parallax: 0.2428"	
			Epoch of Position: 2010.8290486	

Comments: Used a calibrator source of similar spectral type as our science target W0855 to do the kernel phase analysis.
Category=Star
Description=[Brown dwarfs]
Extended=NO

Acquisition

#	Target	Acquisition Mode	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	2 UGPSJ072227.51-054031.2	AMIFAINT	F480M	NISRAPID	19	1	1	0.93	115390.55

Template

Subarray	Direct Image
SUB80	true

Dithers

#	Primary Dithers	Subpixel Positions
1	NONE	NONE
2	NONE	NONE

Direct Image

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	120	125	1	125	1143.59	115390.54

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F480M	NISRAPID	2	1	1	1	0.247	115390.56

PSF References	PSF Reference: true
Special Requirements	No Parallel Attachments Sequence Observations 5, 7, 8, 9, Non-interruptible

Observation

Proposal 1230, Observation 5: MIRI MRS Thu Dec 08 23:00:30 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Diagnostics

(MIRI MRS (Obs 5)) Warning (Form): Imager Filter overlap.

(MIRI MRS (Obs 5)) Warning (Form): Imager Filter overlap.

(MIRI MRS (Obs 5)) Warning (Form): Imager Filter overlap.

(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE0855-0714	RA: 08 55 4.0620 (133.7669250d)	Proper Motion RA: -8118.396 mas/yr	
		Dec: -07 14 34.16 (-7.24282d)	Proper Motion Dec: 680.546 mas/yr	
		Equinox: J2000	Parallax: 0.448528"	
			Epoch of Position: 2022.9	

Comments: The proposal target has a very high proper motion (~8"/year) and large parallax (0.5").
We have listed its expected position as viewed from Earth near the midpoint of the observing window in late 2022.
Category=Star
Description=[Y dwarfs]
Extended=NO

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
F1000W	ALL	YES	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	2-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F1280W	FASTR1	11	14	1	Dither 1	2	28	926.863	
1	LONG(C)	MRSLONG		FASTR1	179	1	1	Dither 1	2	2	993.464	12712.11
1	LONG(C)	MRSSHORT		FASTR1	179	1	1	Dither 1	2	2	993.464	12712.9
2		IMAGER	F1280W	FASTR1	11	14	1	Dither 1	2	28	926.863	
2	MEDIUM(B)	MRSLONG		FASTR1	179	1	1	Dither 1	2	2	993.464	12712.7
2	MEDIUM(B)	MRSSHORT		FASTR1	179	1	1	Dither 1	2	2	993.464	12712.5
3		IMAGER	F1280W	FASTR1	11	14	1	Dither 1	2	28	926.863	
3	SHORT(A)	MRSLONG		FASTR1	179	1	1	Dither 1	2	2	993.464	12712.3
3	SHORT(A)	MRSSHORT		FASTR1	179	1	1	Dither 1	2	2	993.464	12712.1

Special Requirements	Sequence Observations 5, 7, 8, 9, Non-interruptible