10796 - A SNAP Image of the Circumstellar Ejecta of AE And in M31

Cycle: 15, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets*	*Configurations*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) AE-AND	ACS/HRC	1	17-May-2006 21:23:52.0	yes

1 Total Orbits Used

ABSTRACT

The "supernova impostor" or Luminous Blue Variable AE Andromedae in M31 has a spectrum that more closely resembles eta Car than any other known LBV, including the presence of anomalously strong and peculiar Fe II emission. An early FOC ultraviolet image of AE And showed a faint, fuzzy extension of the presumed stellar object. This may be nebulosity from an earlier eruption, or a very nearby UV-bright star. Possibly AE And is embedded in a bipolar nebula. In any case, 2-color ACS/HRC imaging will show the nature of this object. The presence of ejecta will be relevant to understanding the anomalous emission. If nebulous, the shape and extent of the ejecta can provide information on the wind geometry. An extended bipolar structure, similar to eta Car, would be especially interesting as it may be a clue to the mechanism of the more energetic giant eruptions.

OBSERVING DESCRIPTION

One orbit is sufficient. Will image AE Andromedae with ACS/HRC, using filters F435W, F555W, and F625W. (Re. filters, see "additional comments.") Since the object is faint, long exposures are not expected to cause saturation. Since high spatial resolution is highly desirable, will box-dither the F435W exposures to improve spatial sampling. For the other filters, simple 2-point dither should be adequate for bad-pixel removal.
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REAL TIME JUSTIFICATION

-- no scheduling constraints are requested --

CALIBRATION JUSTIFICATION

-- none requested --

ADDITIONAL COMMENTS

The original proposal named only two filters, F435W and F625W. Now we find, however, that there is sufficient visibility time to include a third, F555W. This is useful in the following way. Small-scale diffuse material around AE Andromedae may be either a reflection nebula or a photoionized nebula. In the latter case, bright H-alpha emission would contribute to an F625W exposure but not F555W. Therefore we hope that 3 filters will show the difference between a reflection nebula and an HII region.
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There is no serious scientific disadvantage to using the third filter, since F555W + F625W together will achieve the goals originally intended for F625W alone in any case. There is a resulting decrease in the total amount of integration time, but not to a serious extent. The third filter doesn't conflict with any other users' plans, since no one else intends to observe this object.

HST's spatial resolution is better with the F435W filter. Therefore a 4-point box dither pattern is used for it (partly to improve the sampling), but a simpler line pattern is OK for F555W and F625W. Bad-pixel removal will probably be simple because the target object is expected to be quite small, most likely less than 30 x 30 ACS/HRC pixels.

Visit

Proposal 10796, Visit 01 Thu May 18 01:23:55 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/HRC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-HRC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.15 Line Spacing=0.098	Coordinate Frame=POS-TARG Pattern Orientation=19.9 Angle Between Sides=63.5 Center Pattern=false		(1)
(2)	Pattern Type=ACS-HRC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.198 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=44.3 Angle Between Sides= Center Pattern=false		(2-3)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AE-AND	RA: 00 43 2.5500 (10.7606250d) Dec: +41 49 12.20 (41.82006d) Equinox: J2000		V=17.5+/-0.5	Reference Frame: ICRS

Comments: Located in M31. Position listed here was estimated using APT/VTT.

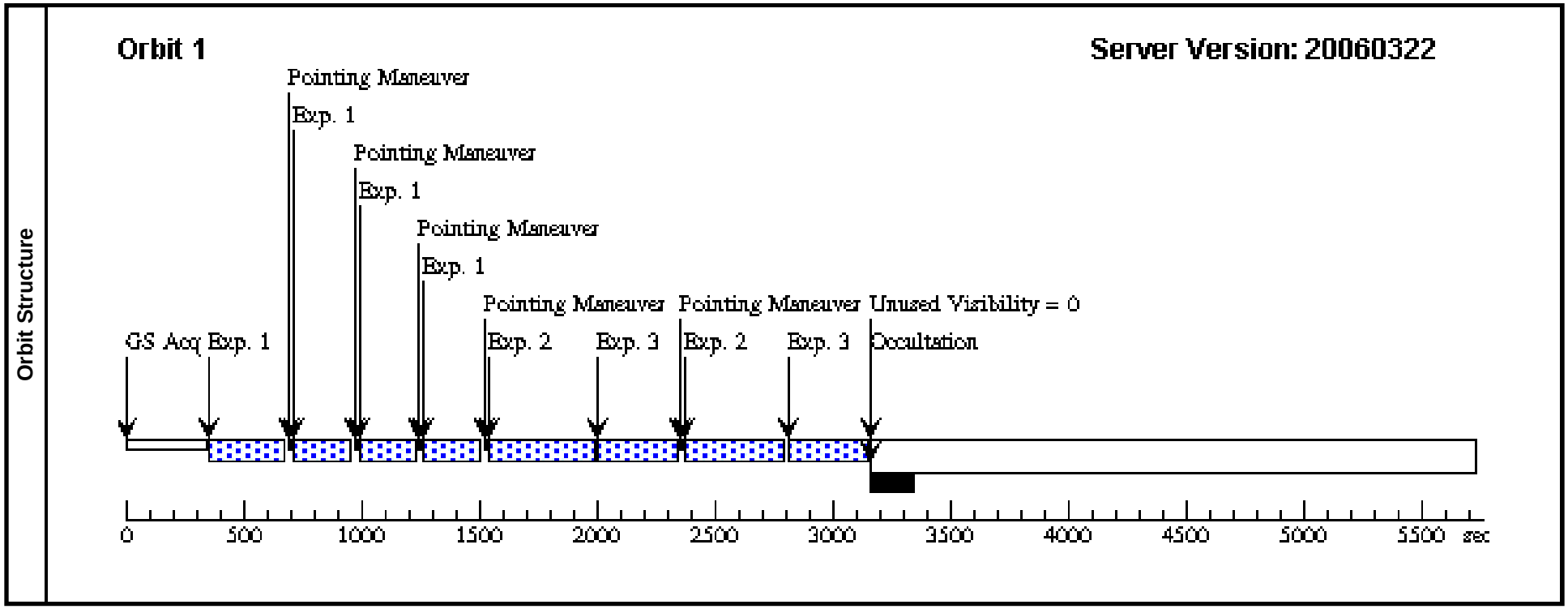
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) AE-AND	ACS/HRC, ACCUM, HRC	F435W	CR-SPLIT=NO		Pattern 1-1 (1)	210.0 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2	F625W	(1) AE-AND	ACS/HRC, ACCUM, HRC	F625W	CR-SPLIT=NO	POS TARG -0.849,-0.831	Pattern 2-3 (2)	370.0 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***

Comments: Reason for POS TARG: This is an extra precaution for the bad-pixel removal process. If an especially bad pixel falls on the rather small target object for the F625W exposures, then the relatively large POS TARG specified here will ensure that the F555W and F625W exposures will not be affected by the same bad pixel.
The specified POST TARG is intended to be dX = -30 HRC columns, dY = -30 rows; but the precise size of this offset is not critical.

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
3	F555W	(1) AE-AND	ACS/HRC, ACCUM, HRC	F555W	CR-SPLIT=NO	POS TARG -0.849,-0.831	Pattern 2-3 (2)	283.0 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***

Comments: Re. POS TARG, see comments for F625W exposure in same pattern.


Orbit Structure
Orbit 1
Server Version: 20060322
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 2
Pointing Maneuver
Exp. 3
Pointing Maneuver
Exp. 2
Pointing Maneuver
Exp. 3
Unused Visibility = 0
GS Acq
Exp. 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec