



11314 - Calibration of MARCI UV using WFPC2

Cycle: 16, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) MARS	WFPC2	1	02-Jul-2007 21:09:34.0	yes
02	(1) MARS	WFPC2	1	02-Jul-2007 21:09:41.0	yes

2 Total Orbits Used

ABSTRACT

Ultraviolet imaging is a major unique component of the MARCI experiment on MRO. Unfortunately the calibration of the UV, especially of the 260 nm filter, on MARCI is uncertain due to various unexpected problems during laboratory calibration. Two orbits of WFPC2 observations are requested to properly calibrate the UV using simultaneous MRO / HST observations in a favorable geometry where HST is "looking over the shoulder" of MRO.

OBSERVING DESCRIPTION

The scientific goal of the observations of Mars proposed herein is to assist in the absolute radiometric calibration of ultraviolet images acquired by the MARCI camera on Mars Reconnaissance Orbiter. In order to maximize the effectiveness of the simultaneous HST and MARCI observations in achieving this goal, it is necessary for HST to observe Mars at the time that MRO is as close as possible to the sub earth point on MARS. This eliminates problems correcting the images to account for different viewing geometries. This puts some constraints on the observations:

1. The orientation of Mars is closest to optimal between August 15 and September 15, 2007. At that time the phase angle of Mars approaches 45° , which corresponds to 3 pm on Mars, the time when MRO crosses the equator. However, the phase is still favorable ($> 42^\circ$) from July 6 until October 4. Mars is observable for 52-53 minutes during this period, according to the 2 Gyro tool at STScI
2. It is important for the success of this project that HST acquires at least one series of images of Mars while MRO is near the sub earth latitude. We believe that it is feasible to coordinate the HST observations with the reliable predictions of MRO location. Long term predictions of the MRO orbit out to 2 months in the future are currently created and are reliable to ~ 30 seconds ($\sim 1.5^\circ$). We believe that this ability affords the opportunity to interactively choose two HST orbits that capture MRO at the sub earth point. The instances of appropriate orientation are densest in mid July and continue through August, 2007.

Taken together, 1 and 2 indicate that the optimum time for scheduling observations would be from mid July through August.

There are no other timing restrictions due either to the aspect of Mars (e.g. a CML constraint) or to any observation schedule of MARCI. MARCI continuously collects the global map data described herein and, although MRO frequently rolls to acquire targets, its 180° FOV of MARCI simply shifts the planet image to a different part of the detector during a roll.

We propose to repeat a sequence of three configurations on each orbit. Based on our past experience with WFPC2 it should be possible to get 3 of these sequences in each orbit. The WFPC2 filters chosen are:

1. F255W Provides excellent match to MARCI 260nm, our highest priority for calibration
2. F336W Not an exact match to MARCI 320 nm, but samples UV continuum outside of Hartley band
3. F439W This is a good match for the MARCI 420nm filter (whose centroid is near 435 nm). It can be paired with 255W / 336W for atmospheric modeling and also check calibration of the VIS filters

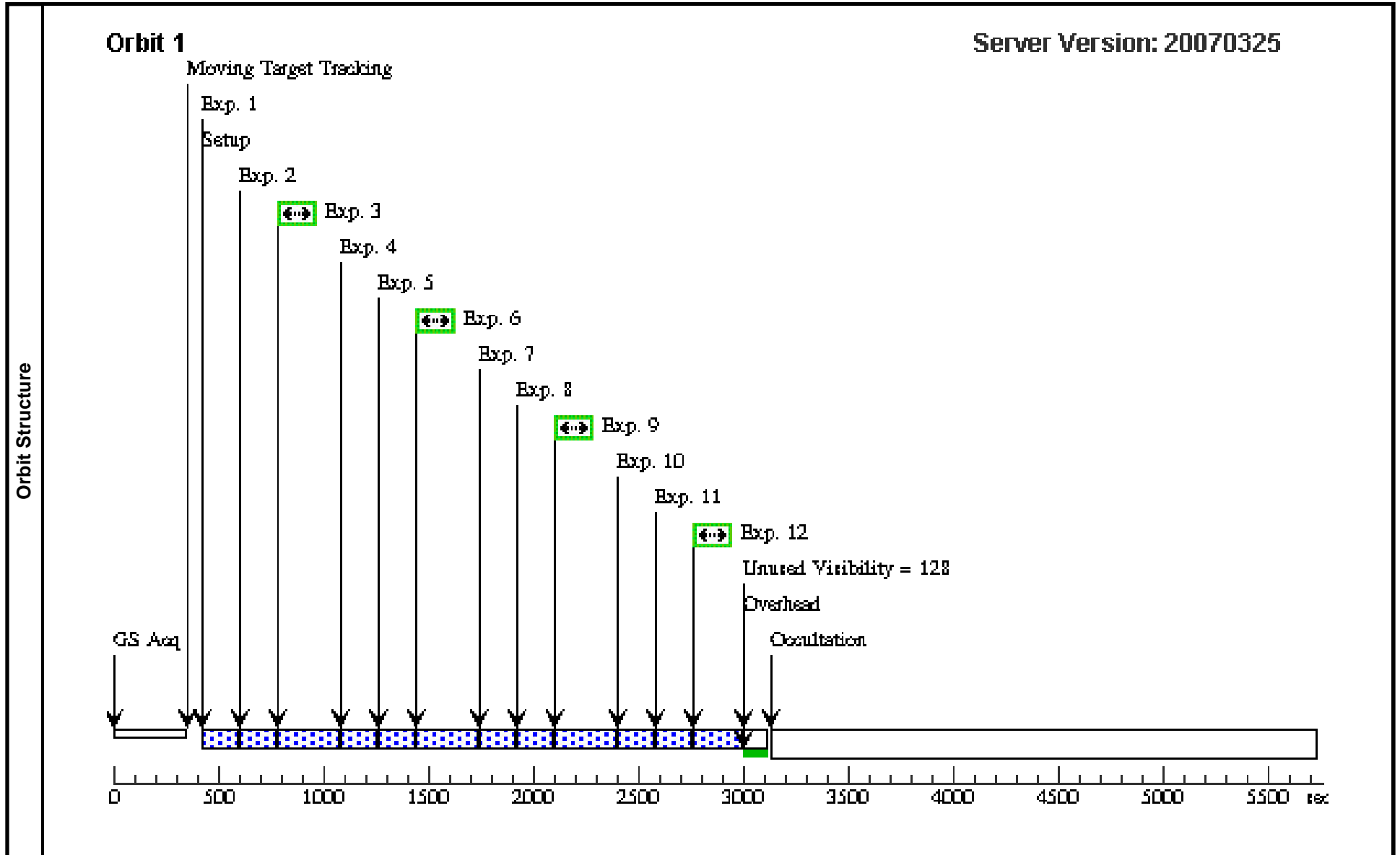
The exposure times are determined from the exposure tool on the WFPC2 web site and from our extensive experience optimizing exposure time

during several previous cycles. The latter is especially important for the short wavelength filters because of the enhanced reflectance of clouds and polar caps.

Proposal 11314 - Visit 01 - Calibration of MARCI UV using WFPC2

Tue Jul 03 01:09:44 GMT 2007

Visit	Proposal 11314, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: BETWEEN 15-JUL-2007:00:00:00 AND 31-AUG-2007:23:59:59									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window			
	(1)	MARS	STD=MARS							
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	2	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
	3	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]
	4	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	5	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
	6	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]
	7	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	8	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
	9	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]
	10	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	11	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
12	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]	



Proposal 11314 - Visit 02 - Calibration of MARCI UV using WFPC2

Tue Jul 03 01:09:45 GMT 2007

Visit	Proposal 11314, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: BETWEEN 15-JUL-2007:00:00:00 AND 31-AUG-2007:23:59:59									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window			
	(1)	MARS	STD=MARS							
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	2	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
	3	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]
	4	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	5	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
	6	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]
	7	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	8	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
	9	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]
	10	(1) MARS	WFPC2, IMAGE, PC1	F439W					0.3 Secs [==>]	[1]
	11	(1) MARS	WFPC2, IMAGE, PC1	F336W					2.0 Secs [==>]	[1]
12	(1) MARS	WFPC2, IMAGE, PC1	F255W					140.0 Secs [==>]	[1]	

