COS SMOV Morning Update

13 July 2009

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Agenda

- NUV Optical Alignment: Visits 97 and 9
- Upcoming Uplinks
- Upcoming COS SMOV Timeline
COS NUV Optical Alignment:
Visit 97 – Aperture and Pointing Sweep

• On Fri 10 July:
  – Repeat of visit 7
    • Implemented revised exposure commanding that does not issue move-aperture command
    • Updated POS-TARG locations
  – Successful execution of fifth set of 7 NUV optical alignment visits
  – Coordinated movement of aperture mechanism and POS-TARG pointing offsets; obtain MIRRORA images at each of 9 positions to characterize off-axis optical image characteristics and locate nominal pointing for best optical quality
    • All POS-TARG and aperture displacements were successful
  – After analysis of visit 97 exposures the result is no mechanism movement or offset in nominal (V2,V3) target pointing is required prior to execution of visit 9
COS NUV Optical Alignment:
Visit 9 – Aperture Mechanism Scan

• On Sun 12 July:
  – Successful execution of sixth set of 7 NUV optical alignment visits
  – Aperture mechanism scan in both X and Y to locate aperture center
    • Obtain MIRRORA image exposures with the aperture mechanism
      moved to each of a series of 17 0.143 arcsec steps across the PSA field
      in X at the same Y and 17 additional exposures across the PSA field in
      Y at the same X - a cross pattern. NOTE: the pointing always remains
      the same - nominally target is centered in un-displaced aperture
      location; also perform get-ahead target acquisition tests
  – After analysis of visit 9 exposures an update to nominal aperture
    mechanism position is required prior to execution of program 11469 visit
    99 early on Monday afternoon;
  – No offset in nominal (V2,V3) target pointing is required prior to execution
    of visit 99 or subsequent SMOV visits; the pointing used for visit 9 will be
    the nominal pointing to be used for future SMOV visits this week
  – ACQ/IMAGE test successful; target displaced by 1 arcsec in both
    coordinates centered to within 0.02 arcsec
Visit 9 – X-direction Aperture Mechanism Scan
Visit 9 – Y-direction Aperture Mechanism Scan

Embargoed figure - Do not distribute
Upcoming Uplinks

• Day 194: Mon 13 July (all already submitted)
  – Ops request for aperture mechanism movement
  – USE OFFSET 11469Q for 11469 visit 99 (executes early Mon afternoon)
  – USE OFFSET 11469F for 11469 visit 99 (same as 11469Q)
  – USE OFFSET 11469L for 11469 visit 99
  – USE OFFSET 11469K for 11469 visit 99
  – USE OFFSET 11492A for 11492 visit 1 (executes early Tues morning)

• Day 196: Wed 15 July (not yet submitted)
  – USE OFFSET 11469N for 11469 visit 95 (executes late Wed evening)
Upcoming COS SMOV Timeline

• Day 194: Mon 13 July
  – 11469 visit 10 of 12 (COS09) COS Fine Optical Alignment
    • s/c visit to facilitate real-time uplink of offset pointing information to be used as OFFSET 11469Q in 1146999 (which follows within ~1 hour); uplink mechanism position updates based on analysis of 1146909;
    • 1146910 194:15:37:52 - 194:16:01:25
  – 11469 visit 99 (11 of 12) (COS09) COS Fine Optical Alignment
    • Use same astrometric target as 11469 visit 93, 5, 97, and 9
    • Apply uplinked offset (from 1146910) to blind pointing position to approximately center target in PSA; use same orient and same astrometric guide stars (GS) as 1146993; no target acquisition
    • Obtain well-centered MIRRORA and B TAGFLASH image exposures with PSA; MIRRORA with BOA; PSA external spectra with all NUV gratings; BOA spectrum with G230L; perform ACQ/PEAKXD and ACQ/PEAKD tests; perform first complete dispersed-light target acquisition
    • 1146999 194:16:55:44 - 195:03:05:07
    • After analysis of imagery uplink refined nominal WCA/PSA aperture offsets for TA with PSA, BOA MIRRORA imaging, PSA MIRRORB imaging, spectra with all gratings, image and spectrum extraction boxes via SMS updates in 201 SMS
Upcoming COS SMOV Timeline

- **Day 194: Mon 13 July**
  - 11482: 4 visits of 20 (COS24) FUV darks
    - 1148213  194:02:45:34 - 194:03:59:44
    - 1148217  194:08:00:00 - 194:09:01:42

- **Day 195: Tues 14 July**
  - 11492 visit 1 (COS34) COS FUV Sensitivity
    - Quicklook visit with primary spectrophotometric standard LDS749B to evaluate FUV sensitivity (COS FUV “first light”)
    - Sample one (default) central wavelength and FP-POS for each FUV grating; use blind pointing, also dispersed-light TA with both detectors
    - Requires USE OFFSET 11492A, which is same offset as for 1146999
  - 11466: 1 visit of 20 (COS05) NUV darks
Upcoming COS SMOV Timeline

• Day 196: Wed 15 July
  – 11469 visit 95 (COS09) COS NUV Fine Optical Alignment
    • Use same astrometric target as 11469 visit 93, 5, 97, 9, and 99
    • Apply uplinked offset (USE OFFSET 11469N) to blind pointing position
to approximately center target in PSA; use ACQ/IMAGE to precisely
center target
    • Obtain MIRRORA images at each of 15 finely-spaced focus positions
      (from -175 to +175 in steps of 25 units); focus-sweep identical to visit 5
    • 1146995 196:22:10:43 - 197:00:05:29
    • Final COS focus-sweep prior to OTA focus adjustment; analyze imagery
to refine COS focus state; possible focus mechanism adjustment via
generic real-time contact prior to Mon 20 July (Day 201)
  – 11482: 1 visit of 20 (COS24) FUV darks
    • 1148214 196:03:42:00 - 196:04:43:42

• Day 197: Thurs 16 July
  – 11482: 1 visit of 20 (COS24) FUV darks
    • 1148215 197:13:40:00 - 197:15:07:51

• Day 199: Sat 19 July
  – 11482: 1 visit of 20 (COS24) FUV darks
    • 1148216 199:00:15:00 - 199:01:16:42