W. W. Hansen Experimental Physics Laboratory

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Gravity Probe B Relativity Mission

PROCEDURE FOR

Science Telescope Fine Scans

GP-B P0230 Rev -

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GP-B Procedure Document 230

Science Telescope Fine Scans

R. E.: Suwen Wang
ESTIMATED DURATION: 1 hour/scan.

Objective:

Performing measurements on telescope response in close range.

Requirements:

- Procedure to be performed by certified personnel only.
- Certified personnel include:
  Suwen Wang

Authority to redline this procedure:

Suwen Wang

Precautions:

- Science Telescope is well protected in the test probe in this procedure. No direct or indirect mechanical contact will be made to the telescope. Therefore, no special caution is needed in handling in this procedure.
- No special electrostatic handling precaution required.

Calibration:

- The scan data related to verifying the telescope performance specifications is in a format of relative numbers. Therefore, no calibration is required for the procedure.

Ground Support Equipment required:

- Telescope room temperature readout electronics.
- Centris 650 computer with data acquisition system.

Expendable Materials required:

- None.

Initial Configuration:

- Telescope under test:
  Dwg No: 25091-201 Rev - _____.
  Telescope Serial No. _____.
- Telescope probe being attached to Artificial Star #2.
- Procedure Start Date: _____.
- Telescope temperature: _____ RT _____ 4K

1. Procedure for a scan:

1.1. Align the star so that the image forms on the telescope axis to within 1 arc sec.

1.2. Align the Artificial Star #2 servo per P0223.

1.3. Record the position of the servo tipping plate for null position reading on the telescope axis:

X tipping plate: _____ inches.

Y tipping plate: _____ inches.

1.4. Set instrument parameters per table 1 below.

1.5. Open the application ScanStar v. 1.0 if it is not already open. The application is on MacIntosh Centris 650 located in Telescope Lab.

1.6. Set all the parameters as indicated in table 2 below. Set A Mtr # to Dewar X.

1.7. Click the run arrow in the application to start the scan.

1.8. Make sure that no one is allowed to touch the star during the scan.

1.9. When the scan is complete, the run busy signal will disappear.

1.10. A set of files of the name: Scan_Dir#_date will be created.

Here:

Dir can be either x or y for the scan direction

is the serial number of the scan of the day

date is the date in the format of m/d/y

1.11. Record the file names in table 3 below.

1.12. Set A Mtr # to Dewar Y and repeat procedures 1.6 through 1.10.

1.13. Procedure 1 complete.

Signed: _____ Date: _____

Table 1. Instrument Parameter Settings

(Tolerances are 10% unless otherwise noted)

Instrument/Parameter Name	Setting	Inspector Stamp
Star Suspension	55 psi front, 35 psi back	
Star Chamber Pressure	500 torr nominal	
Star Laser Diode Current	11.0 mA +/- 0.1 mA	
Star Focus Adjustment	At focal point (6 turns out)	
Telescope Probe Pressure	At vacuum (< 1 torr)	
Telescope Temperature	295 K or 4 K	

Table 2. Application Parameter Settings

Button Name	Setting	Inspector Stamp
Function	Init & Run	

Serial Port	IP Serial B	
Scan Type	X Scan	
Init Mtr Mvmnt	Rewind	
Mtr Spd (stps/sec)	100	
Mtr/PZT	Stp Mtr	
# Grids	100 or as appropriate	
Tot # Stps	8000	
Init A	0.50	
Init B	0.50	
A Mtr #	Tip X or Tip Y	
B Mtr #	NOT USED	
Init Mov Dirtn	Positive	
Sample Rate (1/sec)	NOT USED	
# Samples/Chan	NOT USED	
Sample Mode	Slope	
Seq #	1	
A/D Brd #	6	
Chan Seq.	0 - 0, 1-1, ... 7-7	
Gains	0-7: 100	
Starting	0.2	
Fit	0.6	
Preamp Gain	1 for RT and 100 for LT	
# pts	250	
# of slp Avrg	10	
Data Rate	2500.00	

Table 3. File Names for Fine Scans

File Path Name: _____.

Temperature	Scan Sequence #	Date	Scan Axis