

Proposal ID 6919: FGS Cycle 6: Three Points of Light

Plan

Reference Transfer Functions of the FGS standard star Upgren 69 ($v = 9.6$, $B-V = +0.5$) will be obtained through the PUPIL and F583W filters at three positions near the center of the field of view. Reference Transfer Functions (TFs) will also be obtained at the center of the fov through the F5ND filter.

Purpose: To monitor the long-term temporal variation of the Transfer Function at 3 different positions in the FOV. Theoretical and semi-empirical models have been unsuccessful in predicting changes in FGS #3. Therefore, we provide a grid of Transfer Scans which are used directly to remove the instrument signature from target observations.

Description: Eighteen transfer scans of Upgren 69 will be obtained at each of three locations distributed azimuthally about the center of the field of view of FGS #3 for each of the F583W and PUPIL filters. Thirty-five scans using the F5ND filter of Upgren 69 will be obtained only at the central location. A modified (shorter) test consisting of PUPIL, F5ND, and F583W measurements at one position will be performed after SMOV. Finally, a contingency repeat of the full test may be required if a large SMOV mirror motion occurs.

Fraction of GO/GTO Programs Supported: 75% GO, 44% GTO

Resources:

Observation: 4 external orbits for the standard Three Points, 2 external orbits for the shortened version, plus 4 contingency external orbits.

Analysis: 0.08 FTE

Special Requirements: Each execution of this test should be performed in back-to-back visits. This test should be performed early in Cycle 6 prior to SMOV. A modified (shorter) test consisting of PUPIL, F5ND, and F583W measurements at one position will be performed after SMOV. Finally, a contingency repeat of the full test may be required if a large SMOV mirror motion occurs.

Accuracy: The goal is to obtain $S/N > 100$. Signal to noise ratios greater than 50 are required.

Products: The transfer functions will be used in pipeline data reductions. The results will be presented in an ISR.

Proposal ID 6920: FGS Cycle 6: Monitor the Long Term Stability of FGS #3

Plan

Several stars in M35 will be observed repeatedly throughout the year on a (roughly) monthly basis using the F583W filter.

Purpose: To characterize the geometric stability of FGS #3 and allow for estimates of the differential corrections to the Overlapping Field Angle Distortion (OFAD) and plate scale calibrations. The temporal variations do not follow specific trends and are of order 1 milli-arcsecond on timescales of a month or less.

Description: Up to 30 observations per visit, using the F583W filter, will be made of targets in M35. This program is repeated approximately monthly and has two orientations. This monitoring will continue after the Servicing Mission.

Fraction of GO/GTO Programs Supported: 75% GO, 88% GTO

Resources:

Observation: 9 external orbits

Analysis: The STAT has had the responsibility and the resources to analyse this test. The necessary OFAD and Long Term Stability (LTSTAB) software and expertise may be acquired over the course of the next year. Otherwise, this requires 0.3 FTE.

Special Requirements:

Accuracy:

Products: OFAD and plate scale coefficients will be used in pipeline calibrations and data reductions, and for trend analysis.

Proposal ID 6921: FGS Cycle 6: Intermediate Plate Scale

Plan

Several stars in NGC 2516, including an asterism observed expressly for this purpose by HIPPARCOS, will be observed through the F583W filter four times over the next year.

Purpose: To provide the plate scale which is used in conjunction with the OFAD to reduce POS mode observations. Three to four HIPPARCOS stars will be used to determine the plate scale to an accuracy of 0.5 mas/arc-minute within the central region of the FOV. Multiple observations are needed to monitor plate scale changes and to accommodate any Servicing Mission-related changes.

Description: Up to 30 observations of targets within NGC 2516 will be made per visit using the F583W filter. All of the targets, including reference stars, will be positioned in or very near the central 4" x 5" "football" region of the pickle. The target field will be visited four times in the next year. Three repetitions will be performed prior to SMOV, with one more performed after SMOV.

Fraction of GO/GTO Programs Supported: 75% GO, 88% GTO

Resources:

Observation: 4 external orbits

Analysis: 0.3 FTE

Special Requirements: This program will require certain ORIENT angles to optimally position the targets in the central region of the field of view.

Accuracy: The goal is to obtain a measure of the plate scale which is accurate to 0.5 mas per arc minute.

Products: The plate scale will be used in pipeline calibrations and data reductions and in trend analysis. The results will be presented in an ISR.

Proposal ID 6922: FGS Cycle 6: Blue TF Calibration

Plan

Reference Transfer Functions (TFs) will be obtained through the PUPIL, F583W, and F5ND filters at the center of the field of view for targets B-V color index < 0.5 mag.

Purpose: To acquire Transfer Function data on a set of blue stars. The Transfer Function varies in lobe structure, and full-width half-maximum as a function of wavelength. Color indices of -0.1 to $+1.9$ can produce variations in full-width half-maximum of up to 10-15%. These color transfer scans will form the basis of a grid from which the GO can select the closest configuration to the target characteristics. The appropriate TF will then be used to remove the instrument signature from the target observations.

Description: Fifteen transfer scans of LAT-COL-1B ($v = 9.6$, B-V = $+0.18$) will be obtained with each of the PUPIL and F583W filters at the center of the field of view of FGS #3. Thirty transfer scans of HD 28149 ($v = 5.5$, B-V = -0.1) at the center of the fov will be obtained using the F5ND filter.

Fraction of GO/GTO Programs Supported: 75% GO, 44% GTO

Resources:

Observation: 2 external orbits.

Analysis: 0.04 FTE

Special Requirements: Both visits should be grouped within 3 days or so.

Accuracy: The goal is to obtain $S/N > 100$. Signal to noise ratios greater than 50 are required.

Products: The transfer functions will be used in pipeline data reductions. The results will be presented in an ISR.

Proposal ID 6923: FGS Cycle 6: Red TF Calibration

Plan

Reference Transfer Functions (TFs) of red stars will be obtained through the PUPIL, F583W and F5ND filters at the center of the field of view.

Purpose: To acquire Transfer Function data on a set of red stars. The Transfer Function varies in lobe structure, and full-width half-maximum as a function of wavelength. Color indices of -0.1 to $+1.9$ can produce variations in full-width half-maximum of up to 10-15%. These color transfer scans will form the basis of a grid from which the GO can select the closest configuration to the target characteristics. The appropriate TF will then be used to remove the instrument signature from the target observations.

Description: Fifteen transfer scans of LAT-COL-1A ($v = 9.7$, $B-V = +1.9$) and SAO 185689 ($v = 9.3$, $B-V = 1.5$) will be obtained through each of the PUPIL and F583W filters at the center of the field of view of FGS #3. Thirty transfer scans will be obtained with the F5ND filter at the center of the field of view for HD 59149 ($v = 6.7$, $B-V = 1.3$) and HD 28484 ($v = 7.9$, $B-V = 1.7$).

Fraction of GO/GTO Programs Supported: 75% GO, 44% GTO

Resources:

Observation: 4 external orbits.

Analysis: 0.04 FTE

Special Requirements: All four visits should be grouped within 3 days or so.

Accuracy: The goal is to obtain $S/N > 100$. Signal to noise ratios greater than 50 are required.

Products: The transfer functions will be used in pipeline data reductions. The results will be presented in an ISR.