



11680 - The Main Sequence Luminosity Function of Low-Mass Globular Clusters

Cycle: 17, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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|---------------------------------|--|---------------------------|
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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) STAR-CLUS-135621-271004 | WFC3/UVIS | 2 | 27-Jun-2008 21:42:19.0 | yes |
| 02 | (2) STAR-CLUS-230644+124619 | WFC3/UVIS | 2 | 27-Jun-2008 21:42:25.0 | yes |

4 Total Orbits Used

ABSTRACT

Theoretical work indicates that the dynamical evolution of globular clusters of low mass and low central concentration is strongly determined by mass-loss processes, such as stellar evaporation and tidal stripping, that can eventually lead to cluster dissolution. In fact, mass loss and cluster disruption is now considered to be a viable explanation for the form of the faint end of the Milky Way globular cluster luminosity function. A clear observational demonstration of the prevalence of cluster mass-loss would have ramifications not only for the dynamical evolution of individual globular clusters and their internal stellar mass distributions, but also for the relationships between halo field and cluster stars and the properties of globular cluster systems in galaxies. Our previous WFPC2 imaging of the low-mass diffuse halo cluster Palomar 5 revealed a main sequence

deficient in stars compared to other low-concentration globular clusters of much higher mass, consistent with there having been a considerable loss of stars from this system. But is Pal 5 typical of low-mass, low-concentration halo clusters? We propose to place the mass-loss scenario on a firm observational footing (or otherwise) by using WFC3 imaging to measure the main-sequence stellar mass functions of two of the lowest-mass lowest-concentration globular clusters in the Milky Way, AM-4 and Palomar 13, in order to search for analogous evidence of stellar depletion.

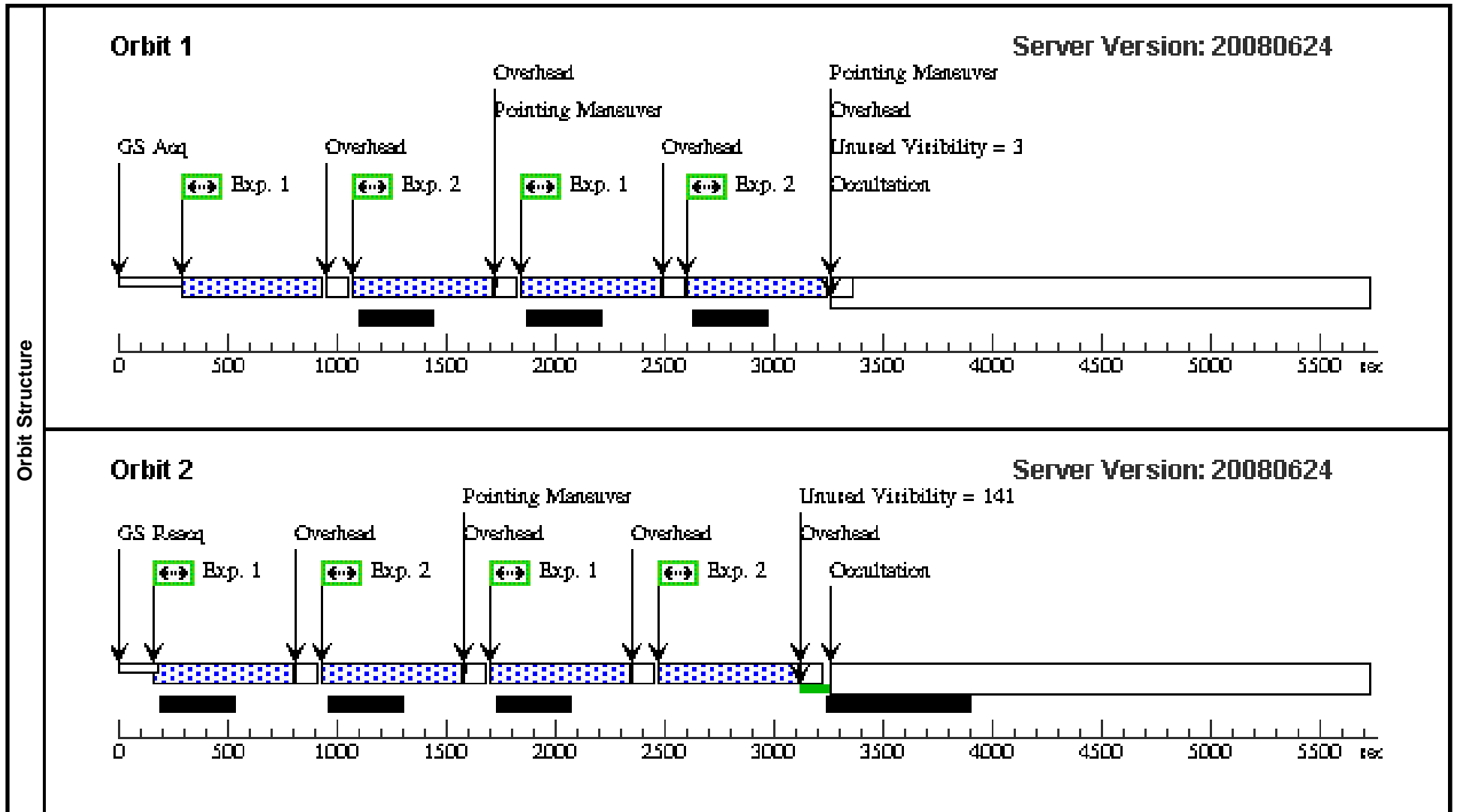
OBSERVING DESCRIPTION

WFC3 imaging is required of two low-mass globular clusters. Exposures will be made in each of the F606W and F814W filters. With each cluster, one full orbit will be spent integrating in each of these two filters, for a total of four orbits in the program. Pointing will be such as to place the center of each cluster on the WFC3 detector center. Observations in each filter will consist of exposures made at four positions in a box configuration using the default WFC3-UVIS-DITHER-BOX pattern. No CR-SPLIT will be invoked since these dithered frames will allow for cosmic ray removal.

Proposal 11680 - Visit 01 - The Main Sequence Luminosity Function of Low-Mass Globular Clusters

Sat Jun 28 01:42:29 GMT 2008

| Visit | Proposal 11680, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|---------------|--|---|--|---|---------------|-----------------------|-----------------|-----------------|-------------------------|-------|
| | Patterns | # | Primary Pattern | | | Secondary Pattern | | | Exposures | |
| | | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 | Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false | | | | | (1-2) | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (1) | STAR-CLUS-135621-271004 Alt Name1: AM4 | RA: 13 56 21.2000 (209.0883333d) Dec: -27 10 4.00 (-27.16778d) Equinox: J2000 | | V=27.0 | Reference Frame: ICRS | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
| | 1 | | (1) STAR-CLUS-135621-271004 | WFC3/UVIS, ACCUM, UVIS | F606W | CR-SPLIT=NO | | Pattern 1-2 (1) | 615 Secs | |
| | | | | | | | | | [=>(Pattern 1)] | [1] |
| | | | | | | | | | [=>(Pattern 2)] | [2] |
| | | | | | | | | | [=>(Pattern 3)] | [2] |
| | | | | | | | | | [=>(Pattern 4)] | [2] |
| 2 | | (1) STAR-CLUS-135621-271004 | WFC3/UVIS, ACCUM, UVIS | F814W | CR-SPLIT=NO | | Pattern 1-2 (1) | 620 Secs | | |
| | | | | | | | | [=>(Pattern 1)] | [1] | |
| | | | | | | | | [=>(Pattern 2)] | [2] | |
| | | | | | | | | [=>(Pattern 3)] | [2] | |
| | | | | | | | | [=>(Pattern 4)] | [2] | |



Proposal 11680 - Visit 02 - The Main Sequence Luminosity Function of Low-Mass Globular Clusters

Sat Jun 28 01:42:30 GMT 2008

| Visit | Proposal 11680, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none) | | | | | | | | | |
|---------------|--|---|--|---|---------------|-----------------------|-----------------|------------------|-------------------------|-------|
| | Patterns | # | Primary Pattern | | | Secondary Pattern | | | Exposures | |
| | | (1) | Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 | Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false | | | | | (1-2) | |
| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous | | | | |
| | (2) | STAR-CLUS-230644+124619 Alt Name1: PALOMAR13 | RA: 23 06 44.4000 (346.6850000d) Dec: +12 46 19.00 (12.77194d) Equinox: J2000 | | V=27.0 | Reference Frame: ICRS | | | | |
| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
| | 1 | | (2) STAR-CLUS-230644+124619 | WFC3/UVIS, ACCUM, UVIS | F606W | CR-SPLIT=NO | | Pattern 1-2 (1) | 610 Secs | |
| | | | | | | | | | [==>(Pattern 1)] | [1] |
| | | | | | | | | | [==>(Pattern 2)] | [2] |
| | | | | | | | | | [==>(Pattern 3)] | |
| | | | | | | | | | [==>(Pattern 4)] | |
| 2 | | (2) STAR-CLUS-230644+124619 | WFC3/UVIS, ACCUM, UVIS | F814W | CR-SPLIT=NO | | Pattern 1-2 (1) | 615 Secs | | |
| | | | | | | | | [==>(Pattern 1)] | [1] | |
| | | | | | | | | [==>(Pattern 2)] | [2] | |
| | | | | | | | | [==>(Pattern 3)] | | |
| | | | | | | | | [==>(Pattern 4)] | | |

