# 15441 - Follow-up Observation of a Hyperluminous Intermediate-mass Black Hole Candidate

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

**INVESTIGATORS**



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|---|---|---|
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**VISITS**

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 01 | (1) 3XMMJ215022.4-055108 | ACS/WFC | 1 | 14-Feb-2018 15:23:19.0 | yes |

1 Total Orbits Used

**ABSTRACT**

Intermediate-mass black holes (IMBH, ~10^2-10^5 msun) have been long sought after because they are associated with several important astrophysical processes. The best IMBH candidates are hyperluminous off-nuclear X-ray sources (HLXs) with LX>10^41 erg/s, but very few are known. We have identified a new HLX candidate (LX~10^43 erg/s), at an offset of 11.6" (12 kpc) from the center of its host galaxy (D L=247 Mpc).

We request a deep (60 ks) XMM-Newton observation of the source in AO17 to measure its flux and spectral evolution while it is in the decay phase of a prolonged outburst, in order to demonstrate its IMBH nature and confirm our tidal disruption event explanation for the outburst. An HST orbit is also requested to confirm that our source is in a star cluster.

**OBSERVING DESCRIPTION**

The program will have one orbit observation of a hyperluminous X-ray source at a distance of 247 Mpc using ACS/WFC F775W. It uses a dither-box patterm, with 544 second per exposure (2176 s in total).

## Visit

**Proposal 15441, Visit 01, implementation**

Wed Feb 14 20:23:20 GMT 2018

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 225D TO 273 D

## Patterns

| # | Primary Pattern | | Secondary Pattern | Exposures |
|---|---|---|---|---|
| (1) | Pattern Type=ACS-WFC-DITHER-BOX<br>Purpose=DITHER<br>Number Of Points=4<br>Point Spacing=0.262<br>Line Spacing=0.192 | Coordinate Frame=POS-TARG<br>Pattern Orientation=18.39<br>Angle Between Sides=68.14<br>Center Pattern=false | | (1) |

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | 3XMMJ215022.4-055108 | RA: 21 50 21.6000 (327.5900000d)<br>Dec: -05 51 3.89 (-5.85108d)<br>Equinox: J2000 | | V=24.60+/-0.06 | Reference Frame: ICRS |

*Comments:*
*Category=STELLAR CLUSTER*
*Description=[ACCRETION DISK, GLOBULAR CLUSTER]*
*Extended=NO*

## Exposures

| # | Label (ETC Run) | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | (1044306) | (1) 3XMMJ215022.4 -055108 | ACS/WFC, ACCUM, WFC1-CTE | F775W | GAIN=2.0 | POS TARG -25,-15 | Pattern 1, Exps 1-1 in Visit 01 (1) | 544 Secs (2176 Secs)<br>*[==>(Pattern 1)]*<br>*[==>(Pattern 2)]*<br>*[==>(Pattern 3)]*<br>*[==>(Pattern 4)]* | *[1]* |

## Orbit Structure