The Global Characteristics of the IBIS-ISGRI Catalogue

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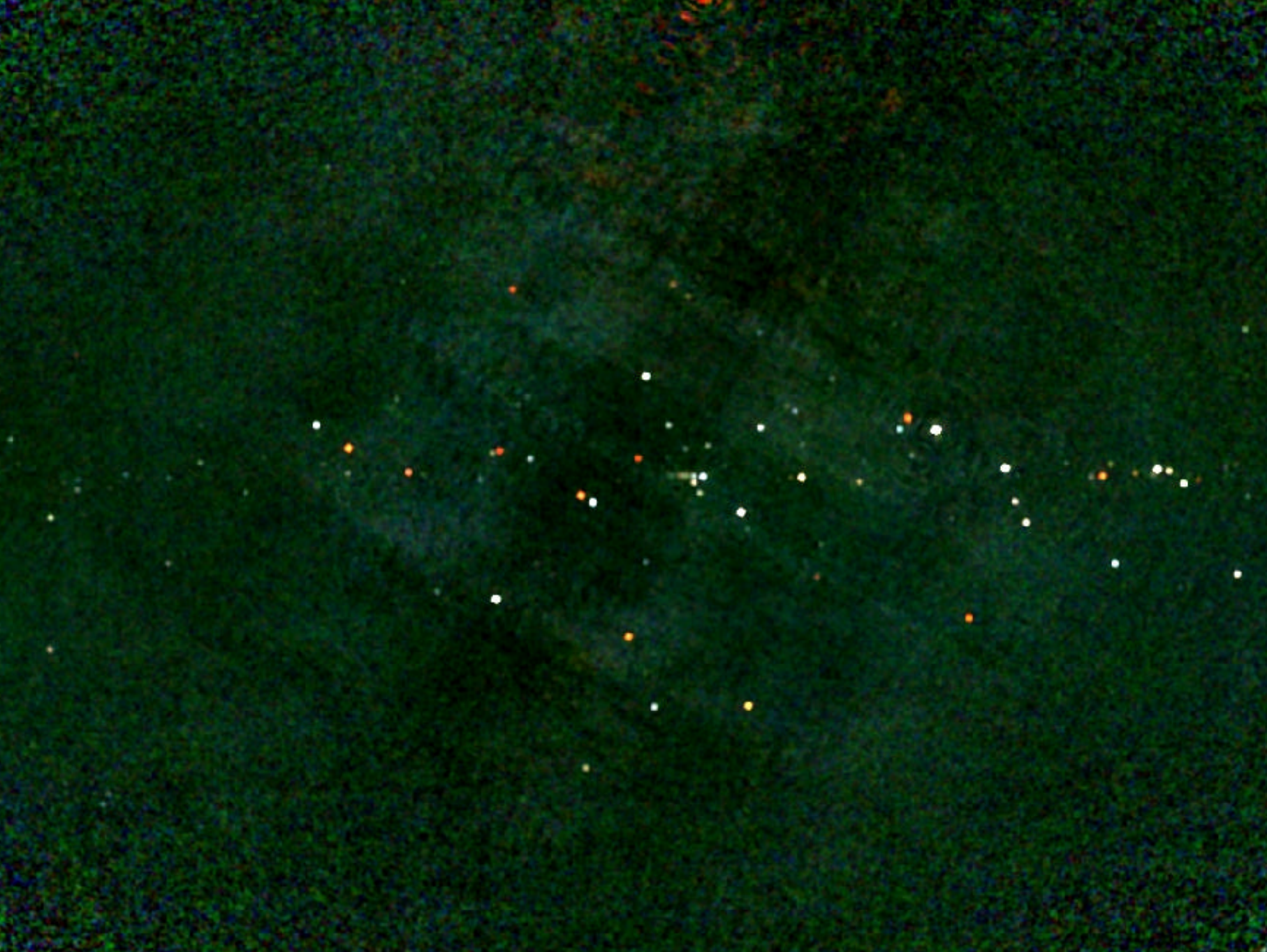
& on behalf of the IBIS Survey Team.



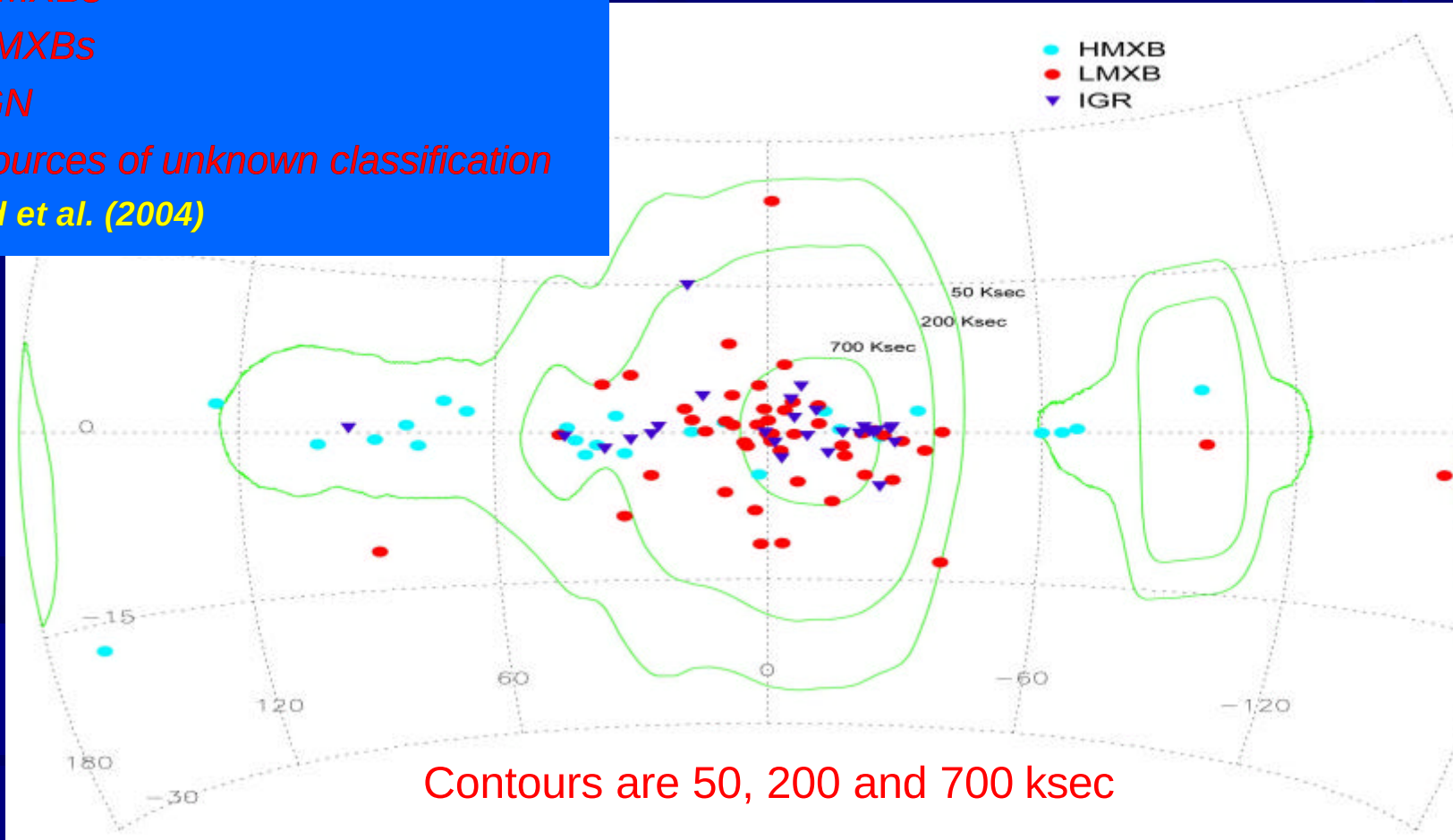
BIS Survey Sources

A sufficient number of HMXBs and LMXBs ha
been observed to begin to investigate their
distribution throughout the galaxy.

IBIS/ISGRI Galactic Plane Survey:

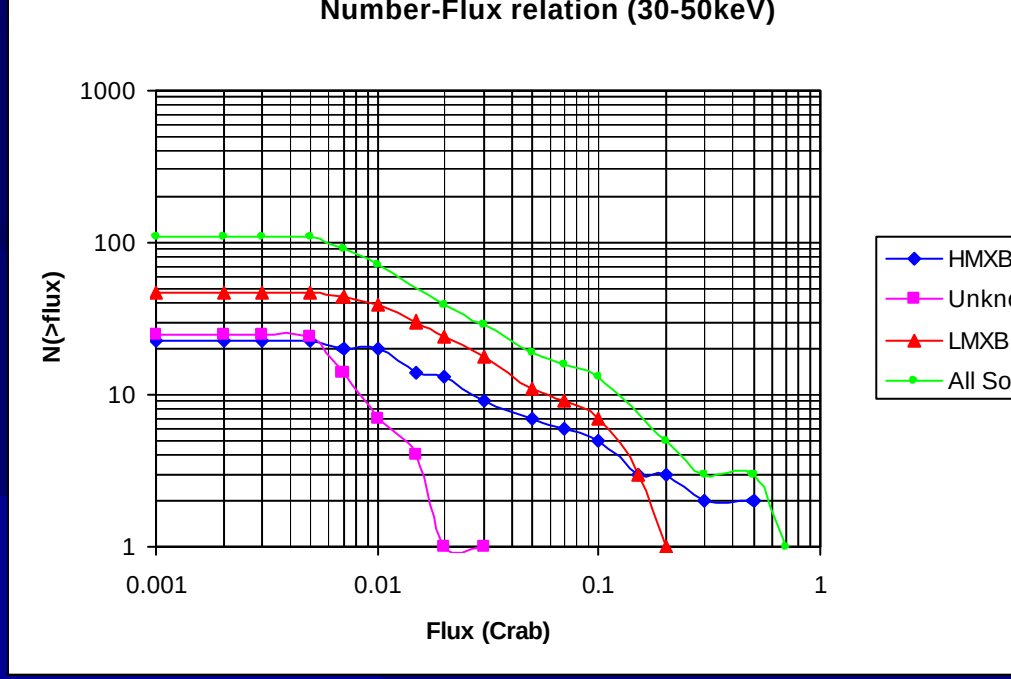
- 123 sources in 20-100 keV energy band including:
  - *23 HMXBs*
  - *53 LMXBs*
  - *5 AGN*
  - *28 sources of unknown classification*

Ref: Bird et al. (2004)



Contours are 50, 200 and 700 ksec

og(N) – Log(S)



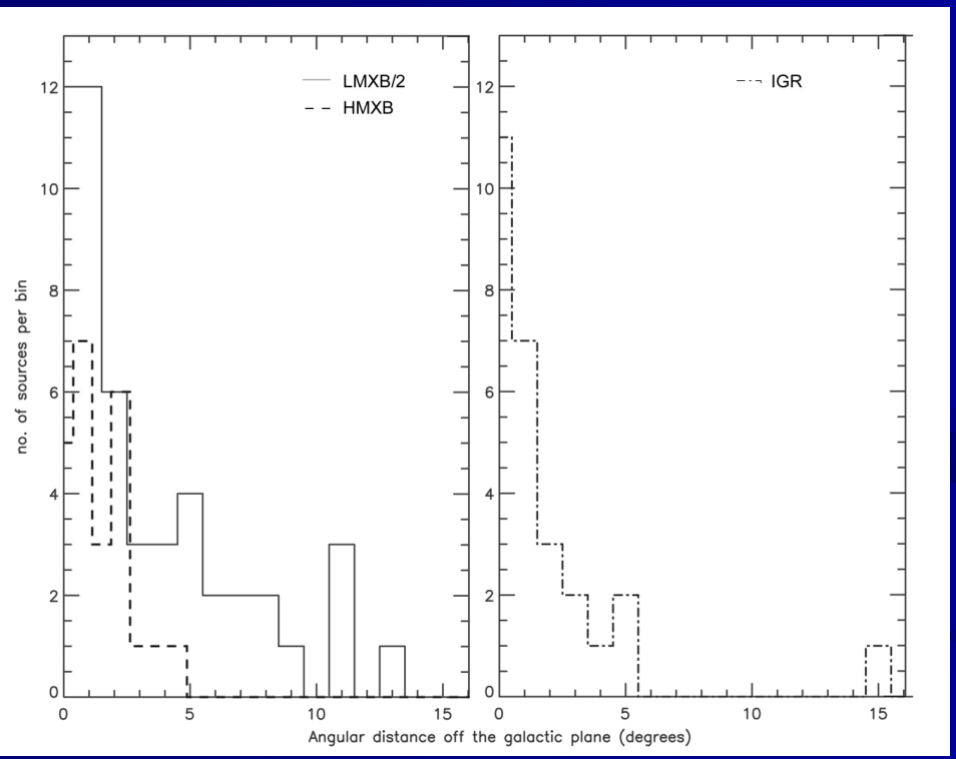
- Not corrected for exposure function
- Flattening at low fluxes indicates limiting sensitivity ~ 5 mCrab
- Slopes are:
  - *- 0.89 for all sources (ASCA: -0.79, Einstein: -1.1)*
  - *- 0.91 for LMXBs (~ -1 as qualitatively expected for a higher scale height population)*
  - *- 0.59 for HMXBs (presumably reflects likely location of these objects in spiral arm)*
  - *- 1.93 for the "unknown" (increasing population towards GC?)*

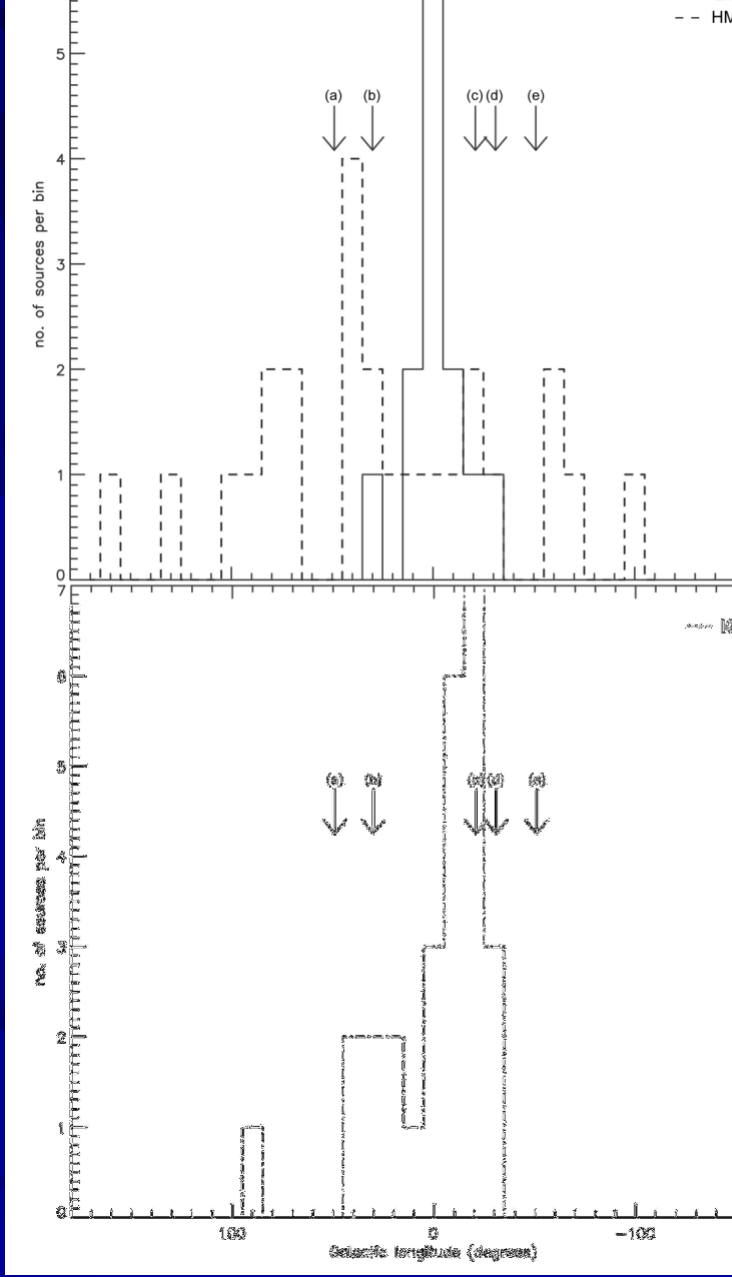
ngular distribution of sources

s expected the LMXBs are concentrated around the and extend high off the Galactic Plane.

MXBs have a more uniform distribution with galactic gitude and are much tighter to the plane in latitude.

he unknowns are concentrated in the GC but exhibit ailed characteristics more like the HMXBs.





Spatial Distribution

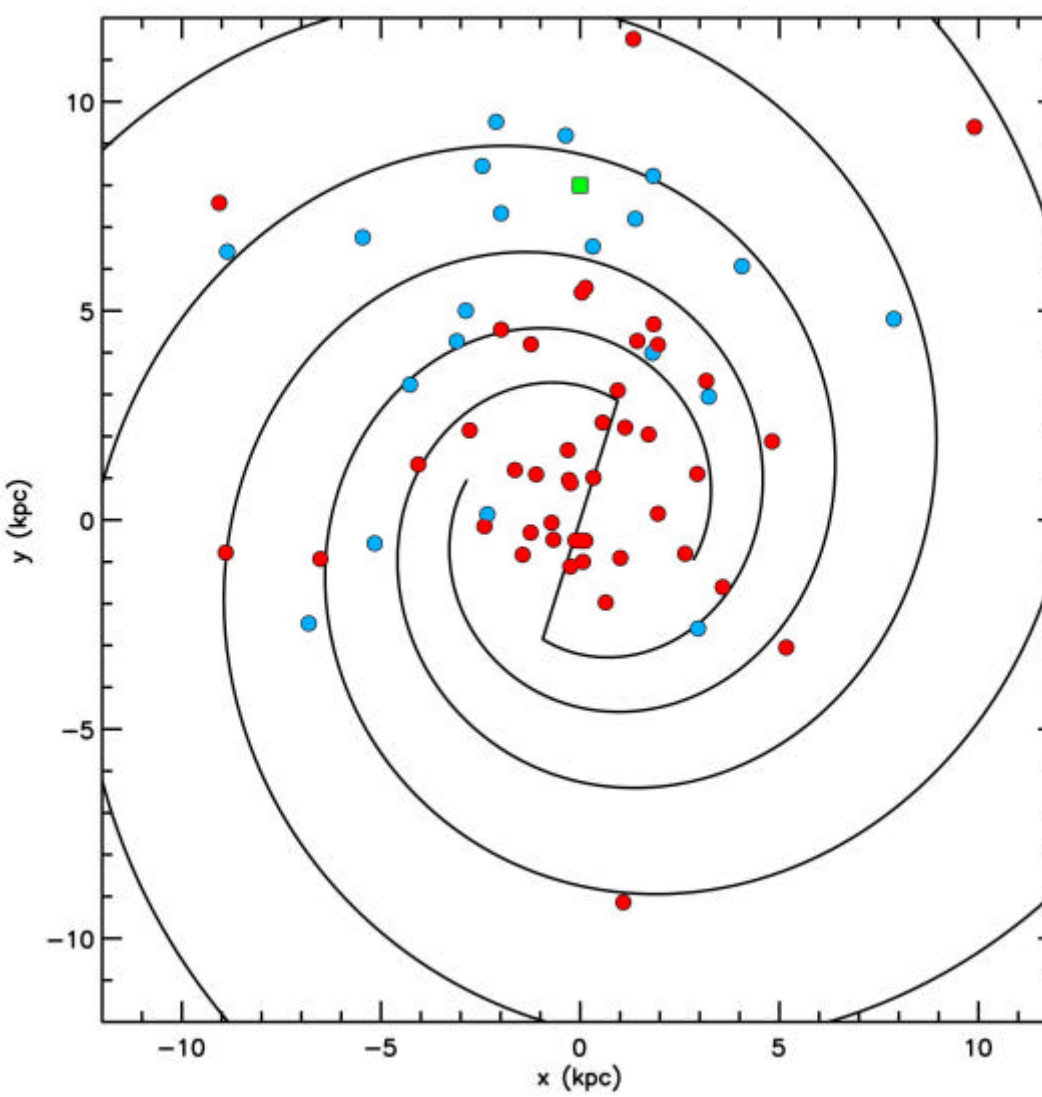
ng known source distances from the literature we can turn this into a 3D model of the galaxy.
spiral arms are modelled using a 4-arm logarithmic spiral (Vallee, 2002).

e circles are HMXBs and red circles are LMXBs.

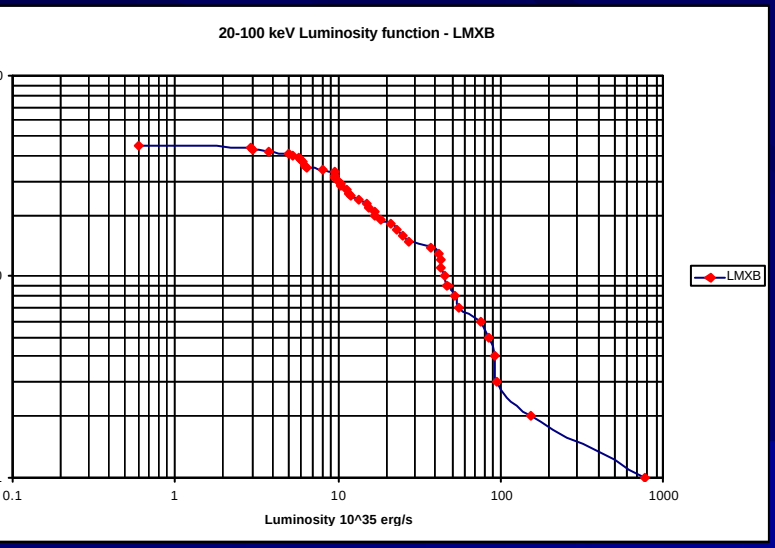
can see that the LMXBS are concentrated in the GC whilst the HMXBs are located more in the spiral arms.

e estimate scale heights for the ulations we find:

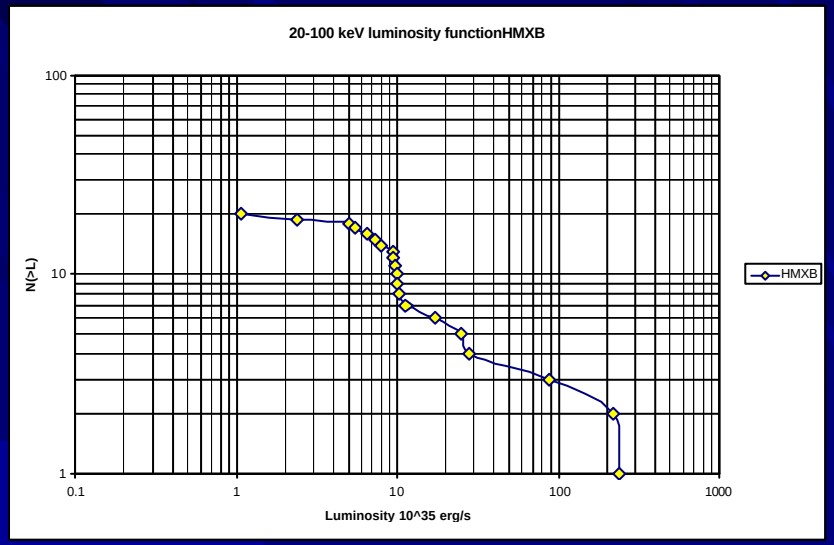
MXBs, H ~ 240 pc
MXBs, H ~ 440 pc
Rs (assuming they are at the GC, 8 kpc y), H ~ 220 pc.



uminosity Functions by Donor



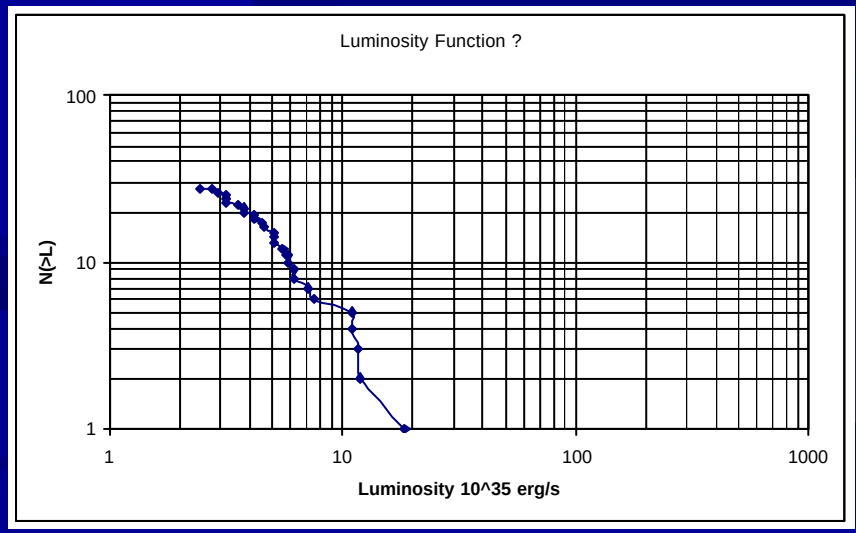
LMXB



HMXB

The "luminosity function" for the unknown sources (assuming all at a distance of 8.5kpc)

In fact ~8 kpc would better fit the 10^{36} erg s^{-1} edge for HMXB



What are the "unknown" Sources?

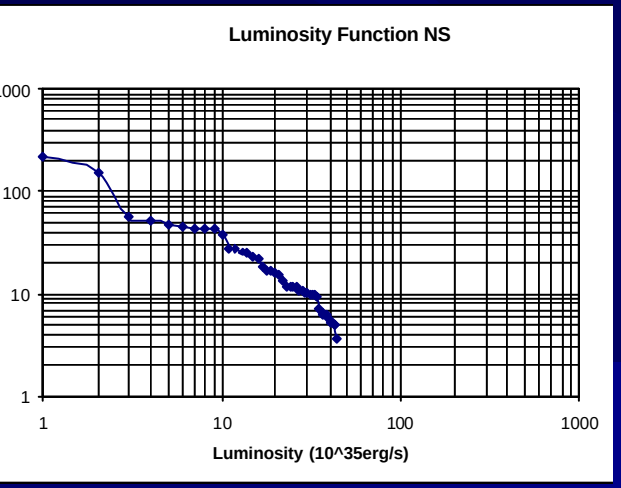
On the basis of:

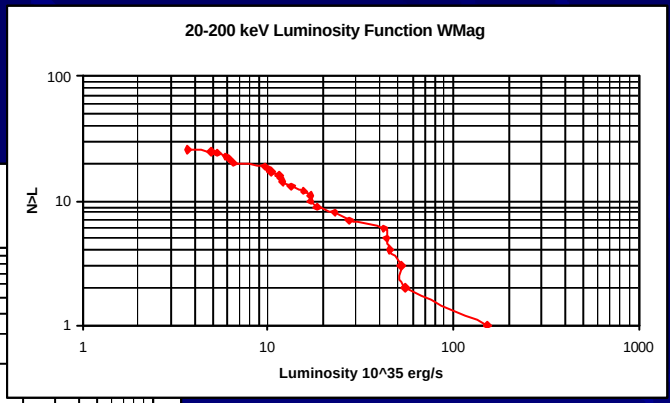
- ***Angular distribution of "?" is more like HMXB (OH5)***
- ***Scale heights of "?" is more like HMXB (OH6)***
- ***Luminosity edge of "?" is at 10^{36} erg s^{-1} like HMXB (OH7)***

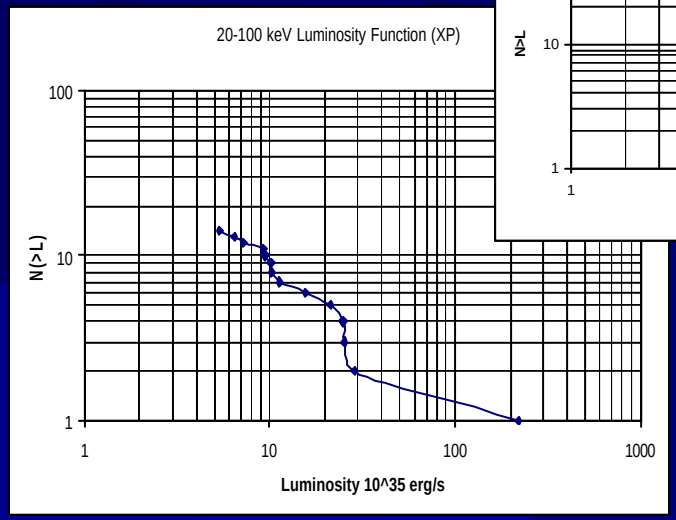
Hence a significant fraction may be obscured HMXB.

uminosity Functions by Compact Object

Neutron star systems

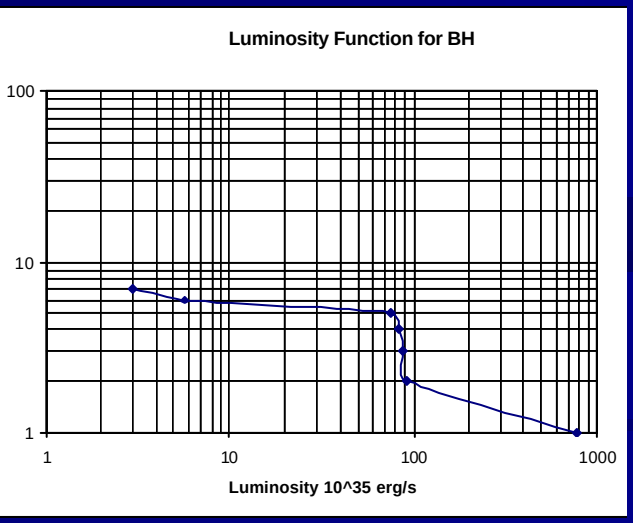






Weak magnetic field

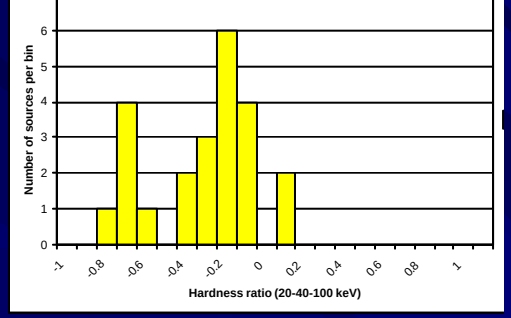
Strong magnetic fields

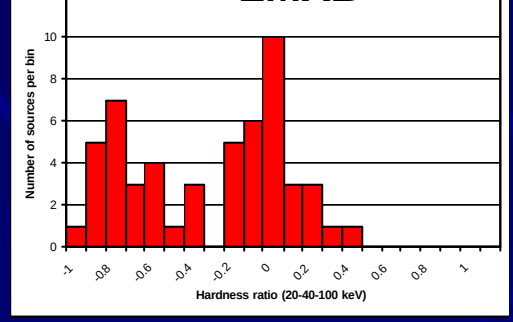


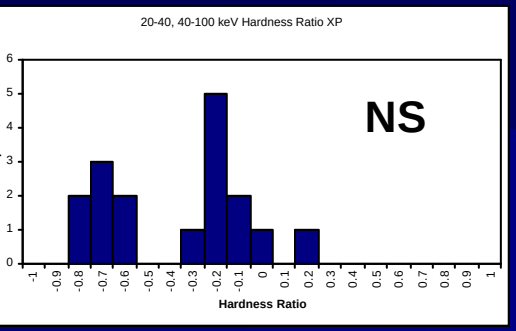
Most γ-ray BHC exist at around 10^{37} erg s^{-1}

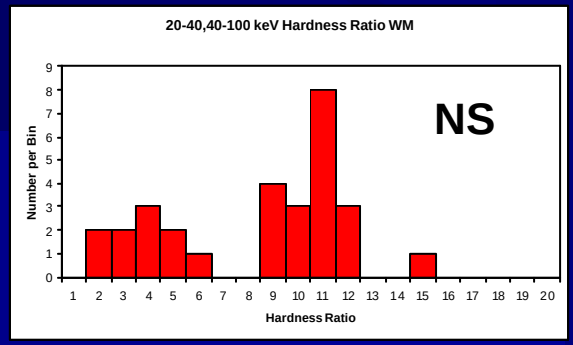
ay Hardness Ratio

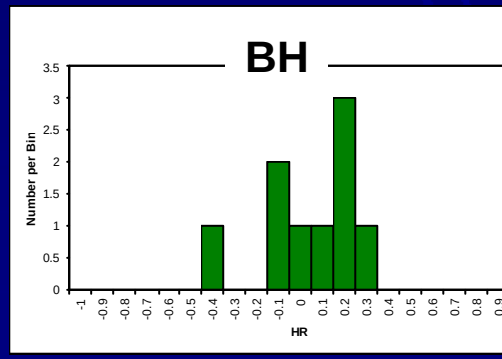
$$HR = \frac{F_{(40-100)} - F_{(20-40)}}{F_{(40-100)} + F_{(20-40)}}$$











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