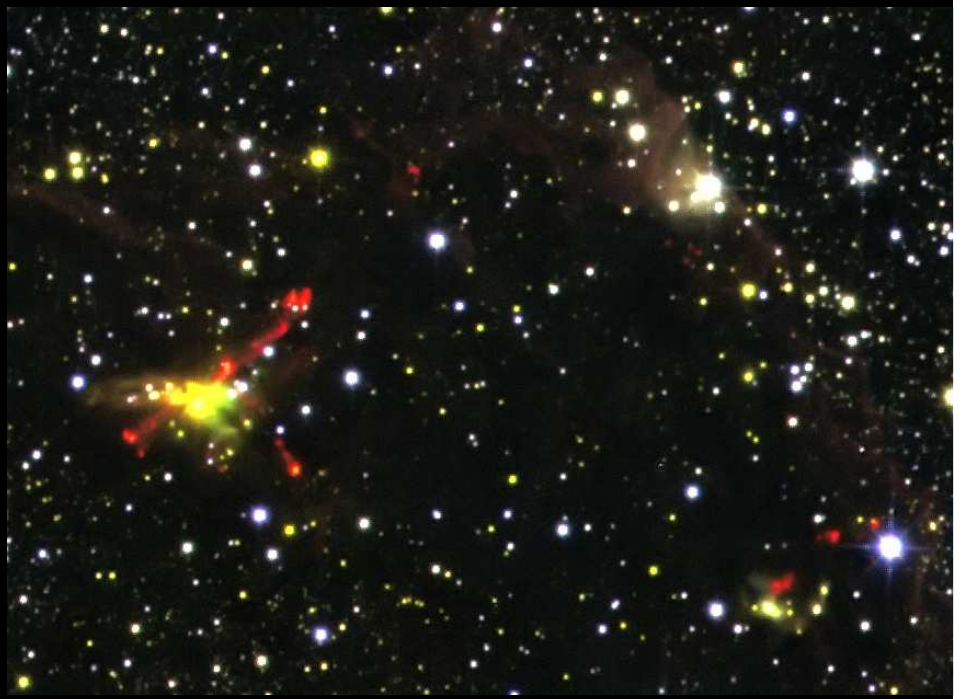
UWISH2

H2 Outflows at 18°< l < 30 °; -1.5 °< b < +1.5 °

First results from the UWISH2 Survey

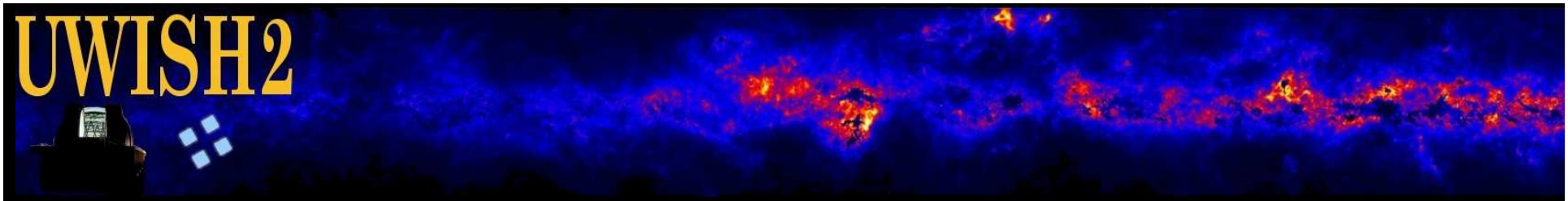
Georgios Ioannidis

Dirk Froebrich

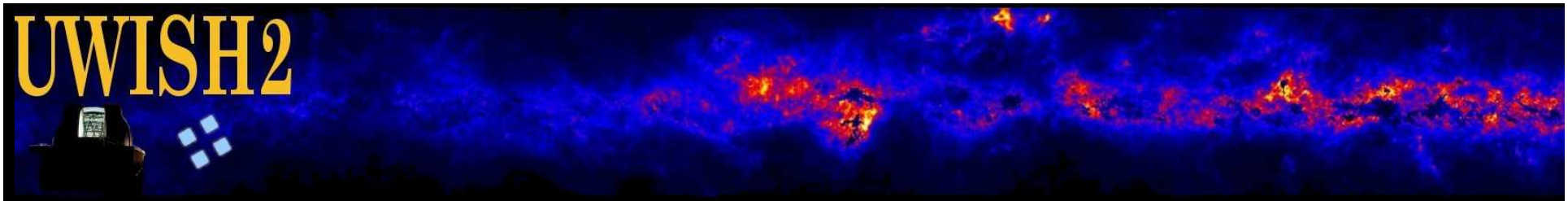


Centre for Astrophysics and Planetary Science (CAPS)

University of Kent



- Scientific objectives
- Covered Area
- Outflows detection; Source Identification
- Distance calculation
- Sources of outflows
- Results so far
- Future work

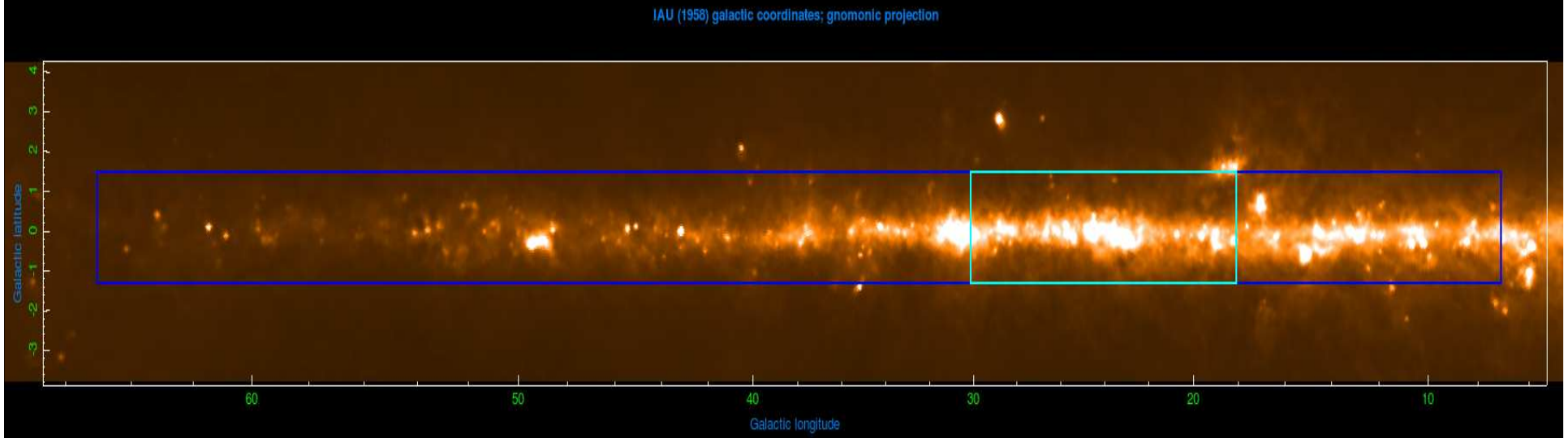


SCIENTIFIC OBJECTIVES

- Characterise the dynamic component of star formation along a large fraction of the Galactic Plane in an unbiased manner.
- Determine the duration of the jet/outflow phase in YSO evolution (fraction of sources with jets/outflows).
- Determine the star formation efficiency along the Galactic Plane.
- How do jet/outflow properties (length, opening angle, power) relate to the source properties (mass, luminosity, age, accretion rates) and/or parental cloud (mass, structure) and/or mode of star formation (isolated/clustered)?

UWISH2

SEARCHED AREA FOR OUTFLOWS



BLUE BOX - UWISH2 SURVEY - 7°< l < 65°; -1.5°< b < +1 .5°

CYAN BOX - SEARCHED AREA - 18°< l < 30°; -1.5°< b < + 1.5°

SEARCHED AREA ~ 20% OF UWISH2 SURVEY

UWISH2

DIFFERENCE IMAGES

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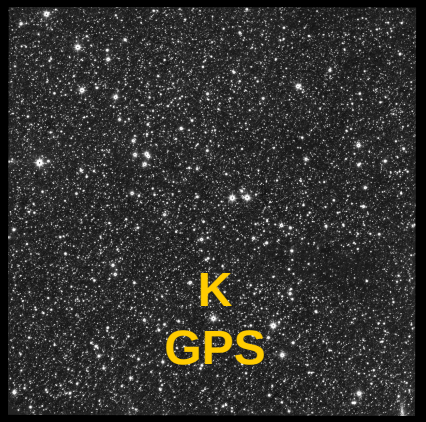

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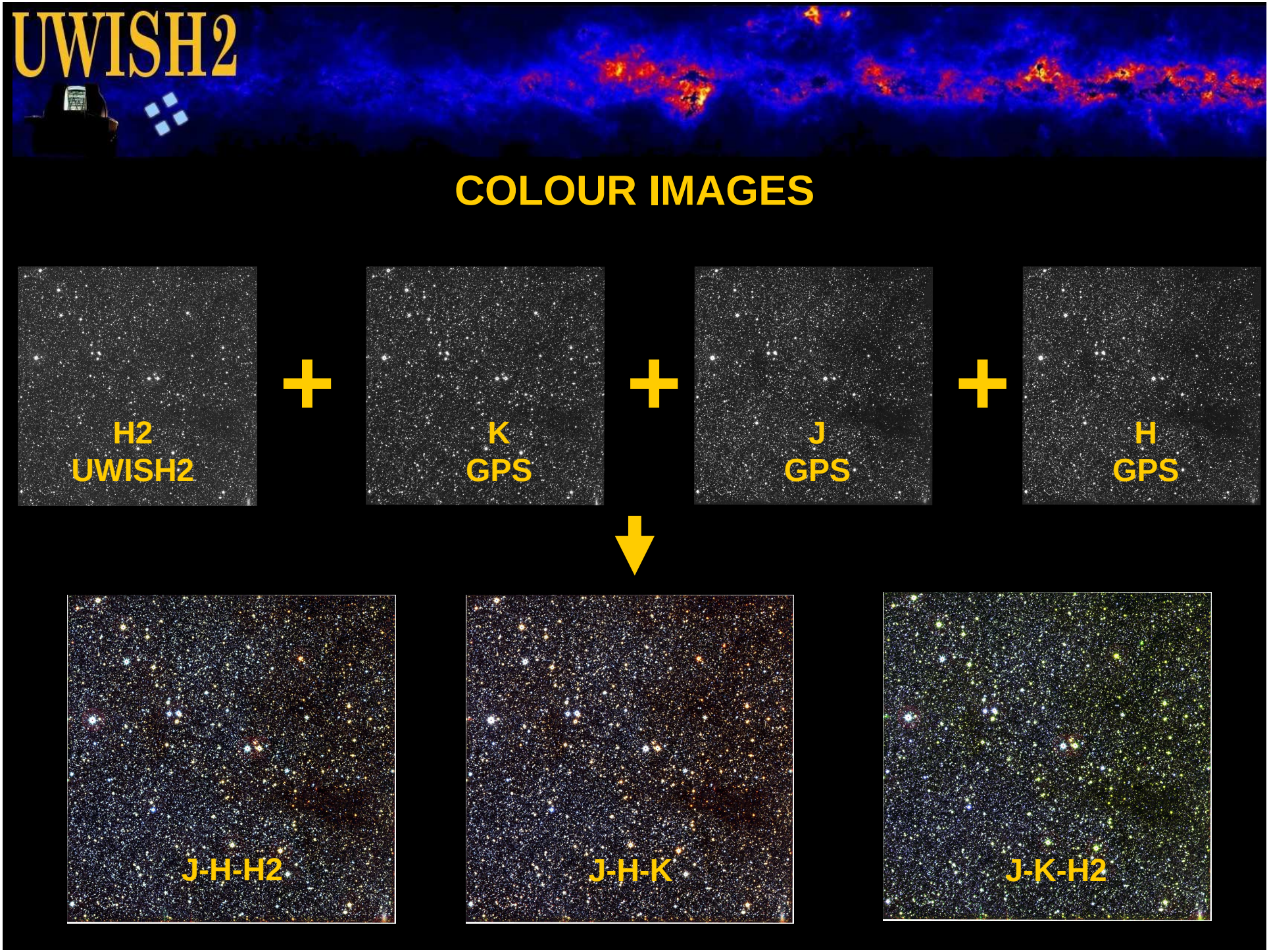

UWISH2
COLOUR IMAGES
H2
UWISH2
K
GPS
J
GPS
H
GPS
J-H-H2
J-H-K
J-K-H2

UWISH2

OUTFLOW SEARCH

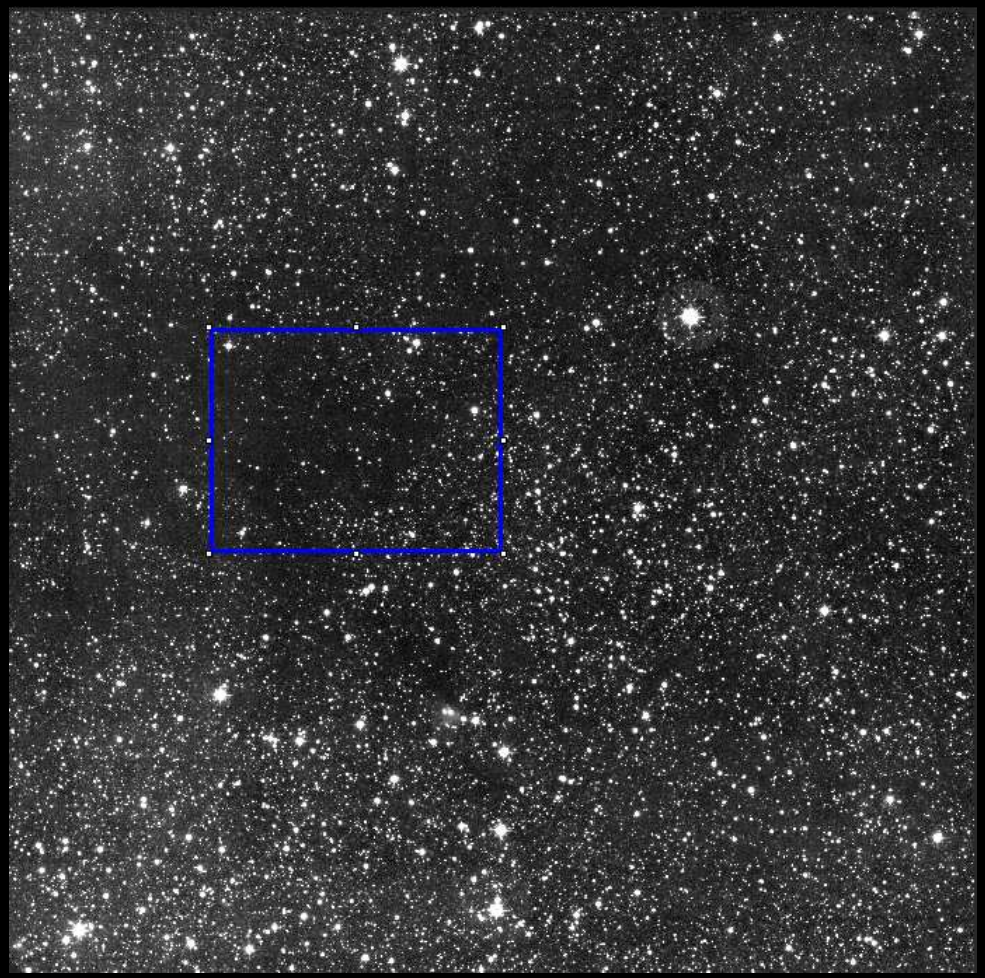
IN TOTAL 744 IMAGES COVERING 33 SQUARE DEGREES
WITH 0.20'' / PIXEL
IMAGES HAVE BEEN SEARCHED IN A RANDOM ORDER

UWISH2

OUTFLOW SEARCH

UWISH2

OUTFLOW SEARCH



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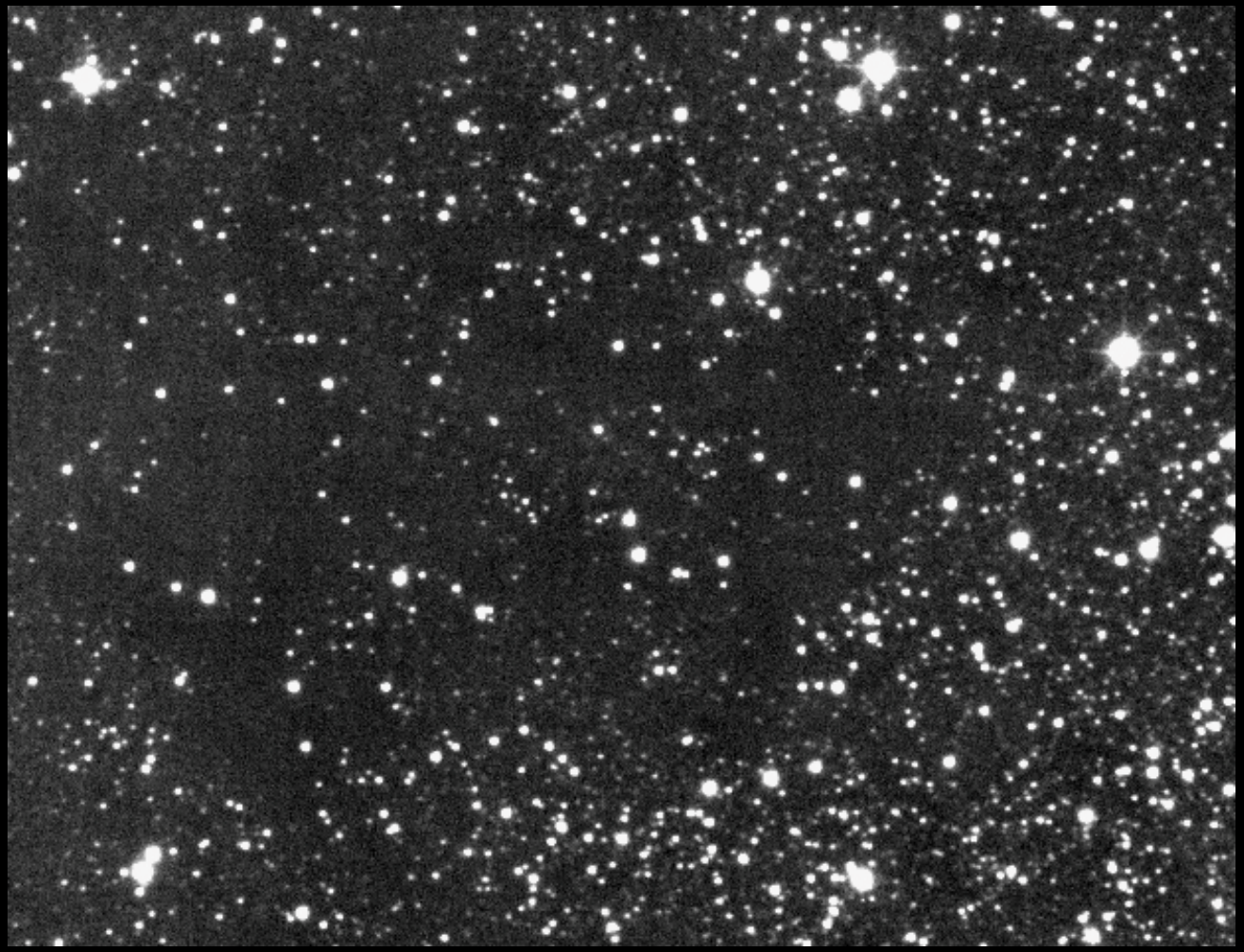
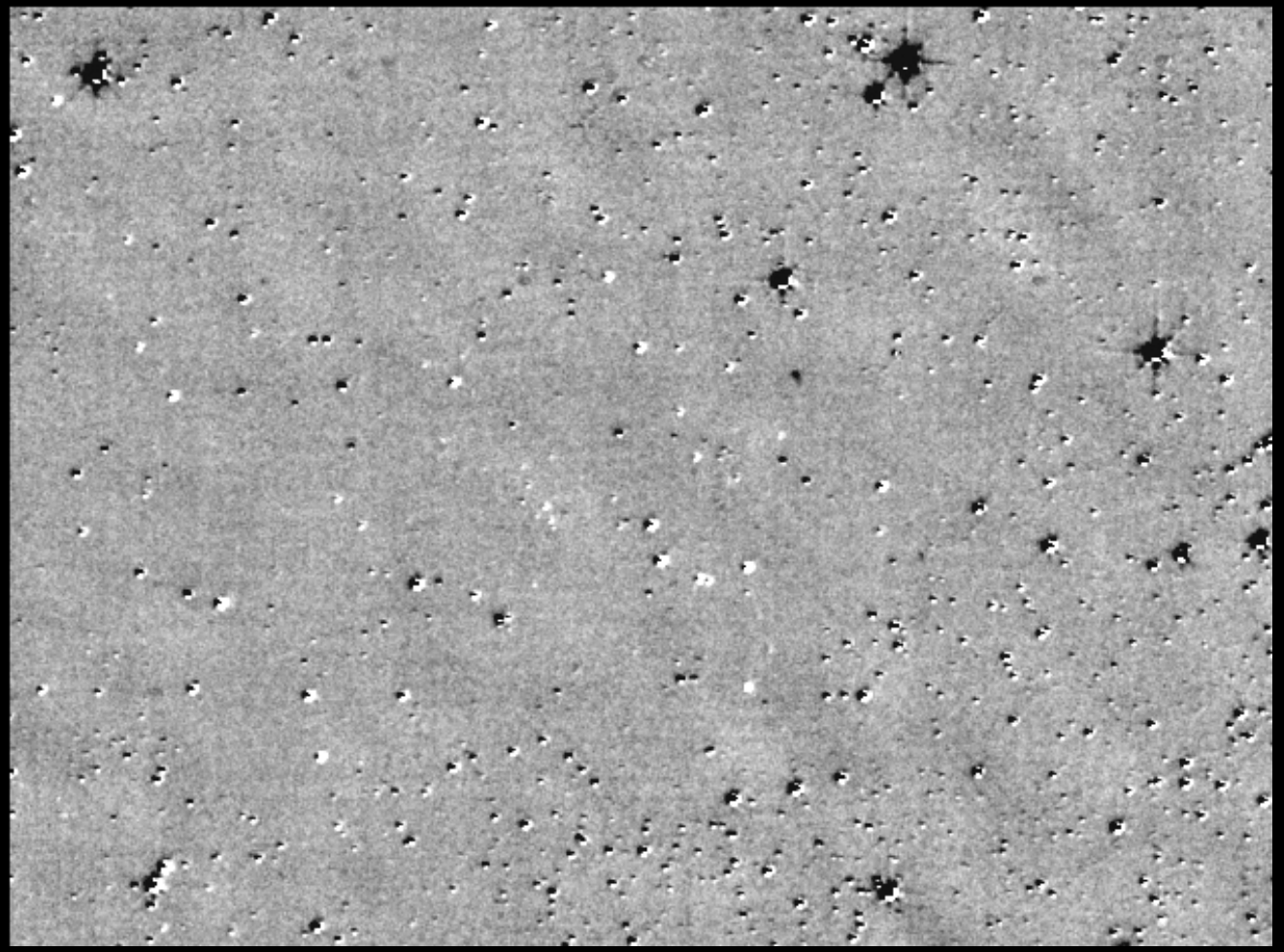
OUTFLOW SEARCH



UWISH2

OUTFLOW SEARCH



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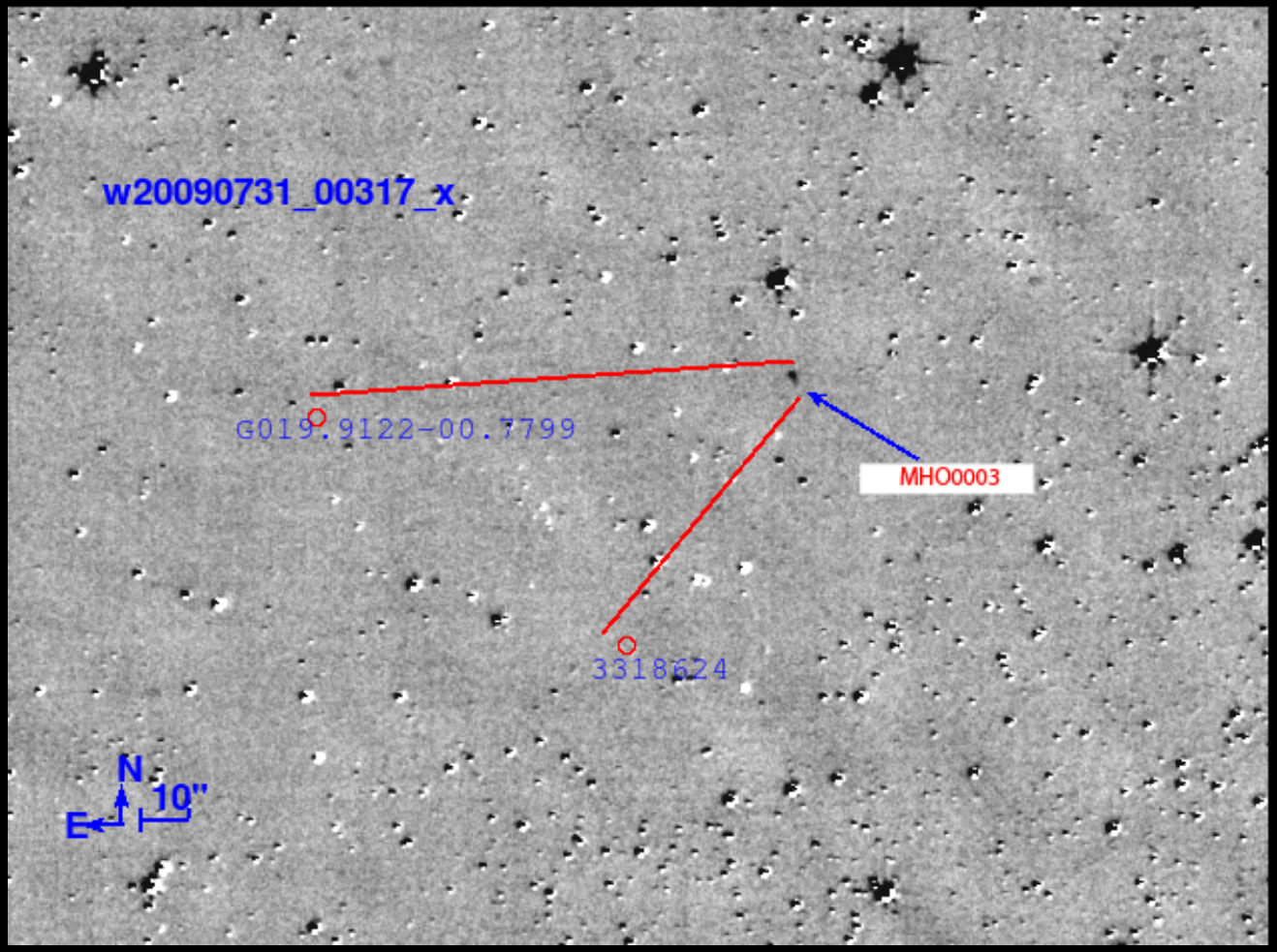
OUTFLOW SEARCH



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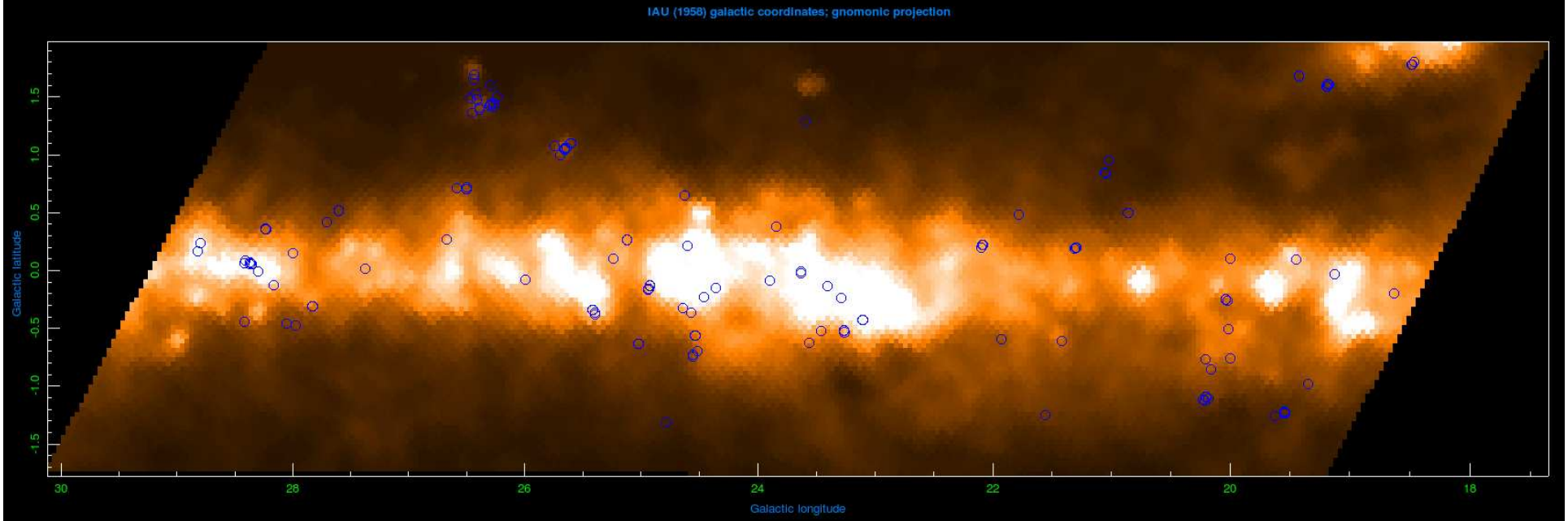
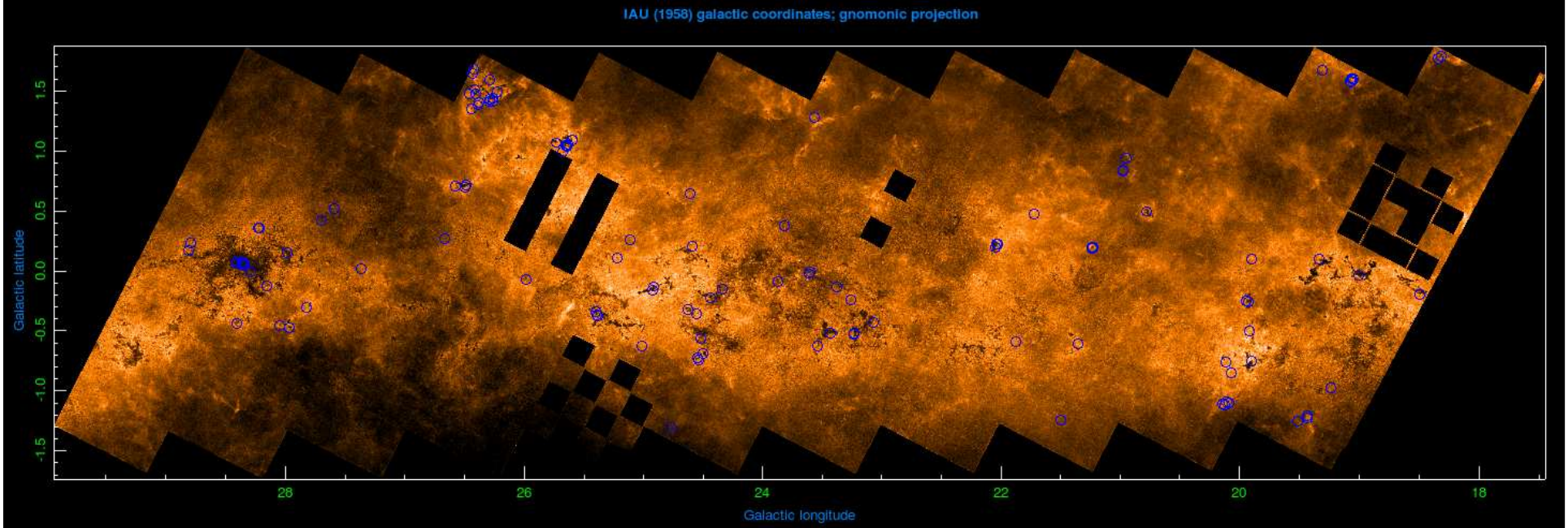
OUTFLOWS ON 100um DUST MAP



125 OUTFLOWS

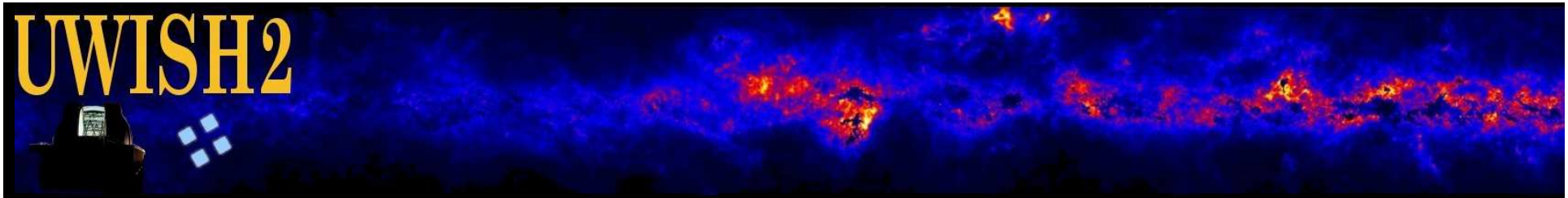
UWISH2

OUTFLOWS ON GPS AV MAP

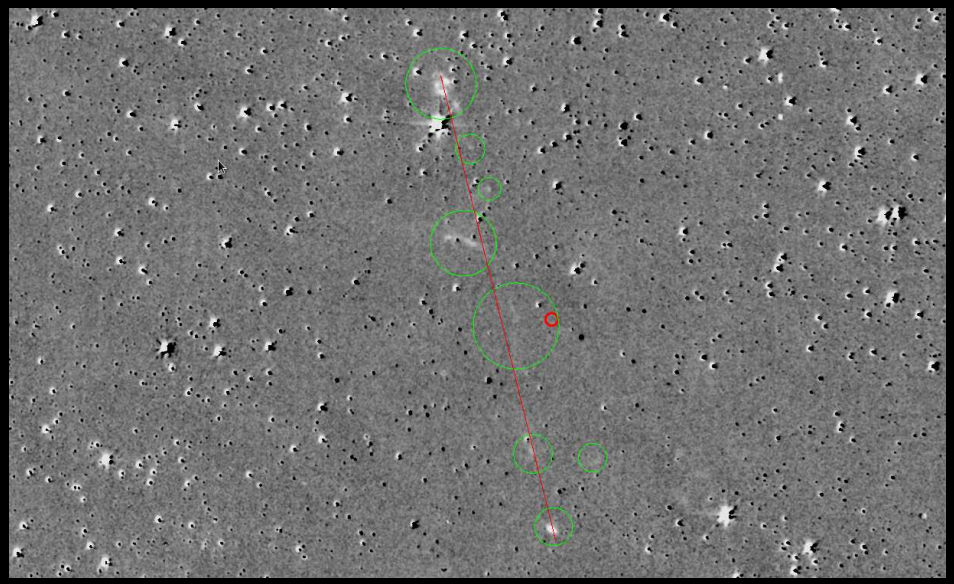


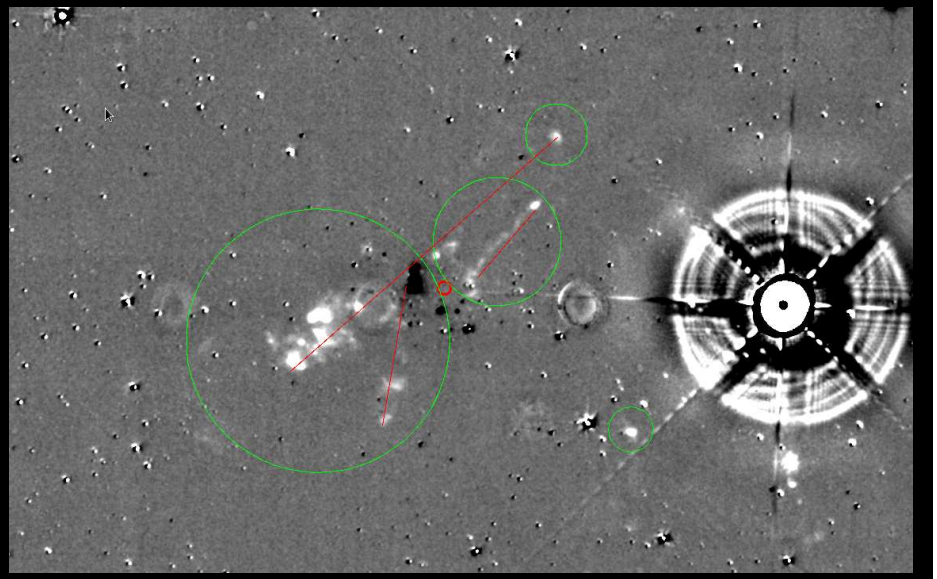
125 OUTFLOWS

UWISH2



SOURCES OF OUTFLOWS





GLIMPSE SURVEY

IRAS

AKARI

BGPS

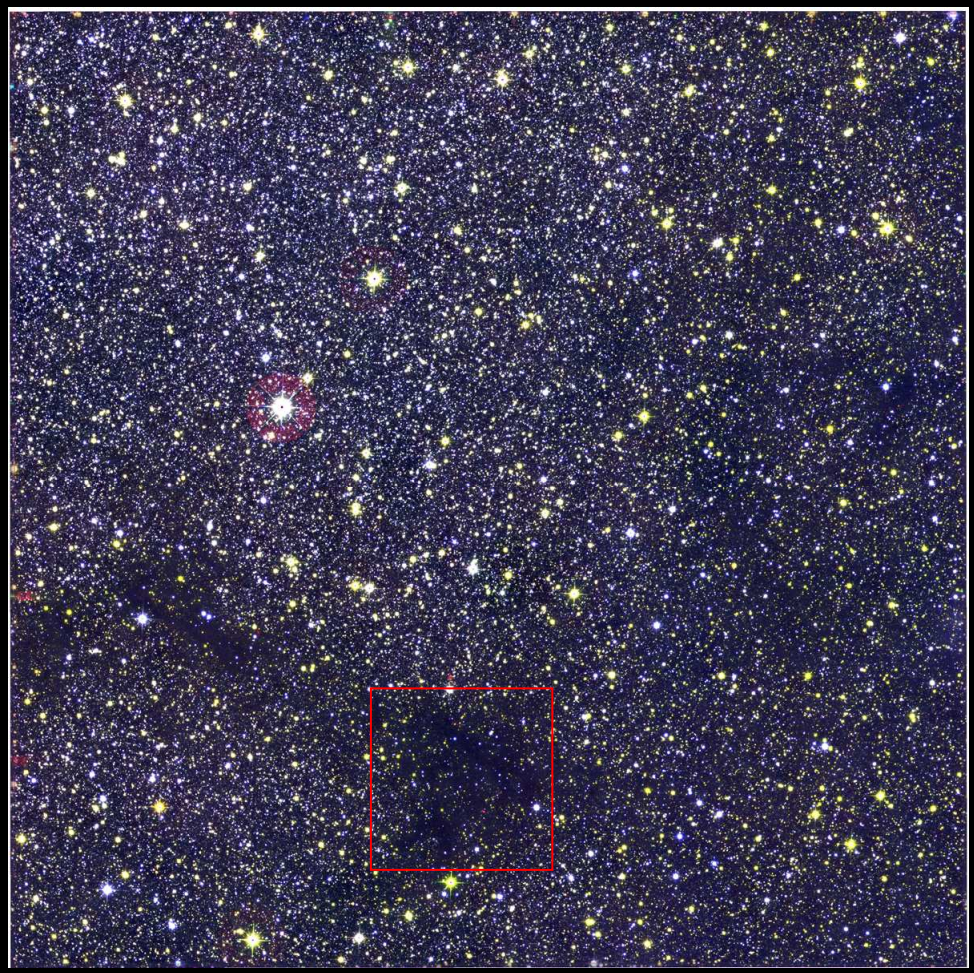
RED EXCESS STARS - VARIABILITY

UWISH2

DISTANCE CALCULATION

UWISH2

DISTANCE CALCULATION



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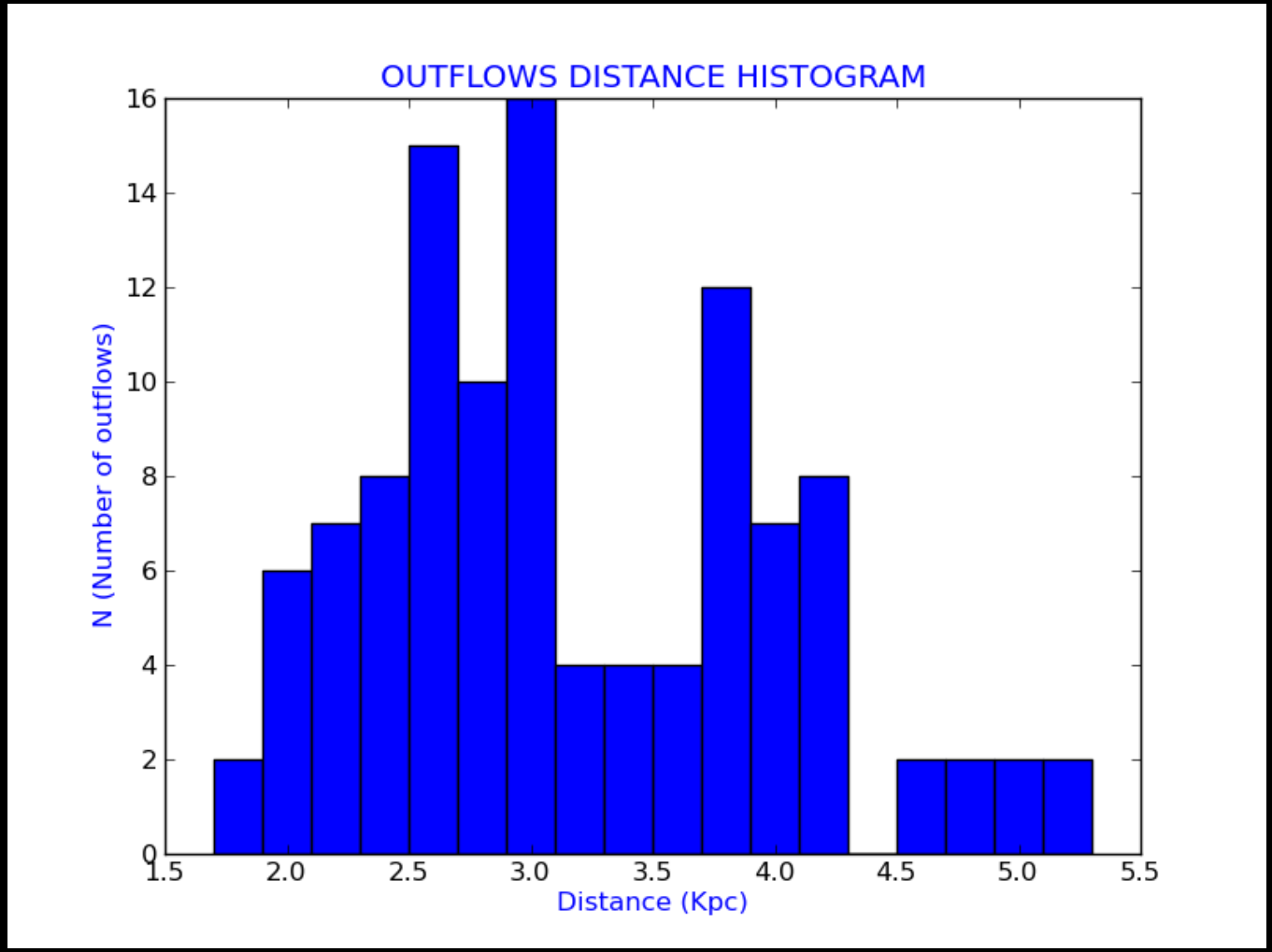
DISTANCE CALCULATION

Measure the number of foreground stars and compare with Besancon Galaxy model (Robin at al. 2003).

UWISH2

RESULTS SO FAR



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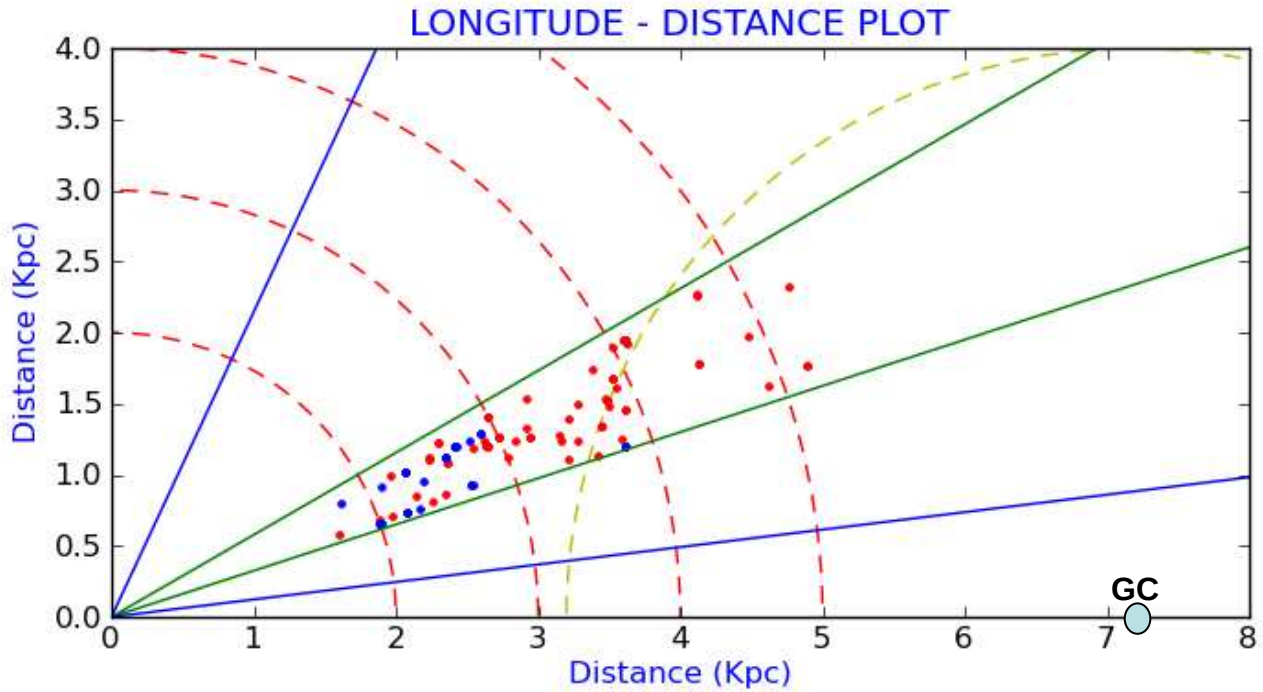
RESULTS SO FAR



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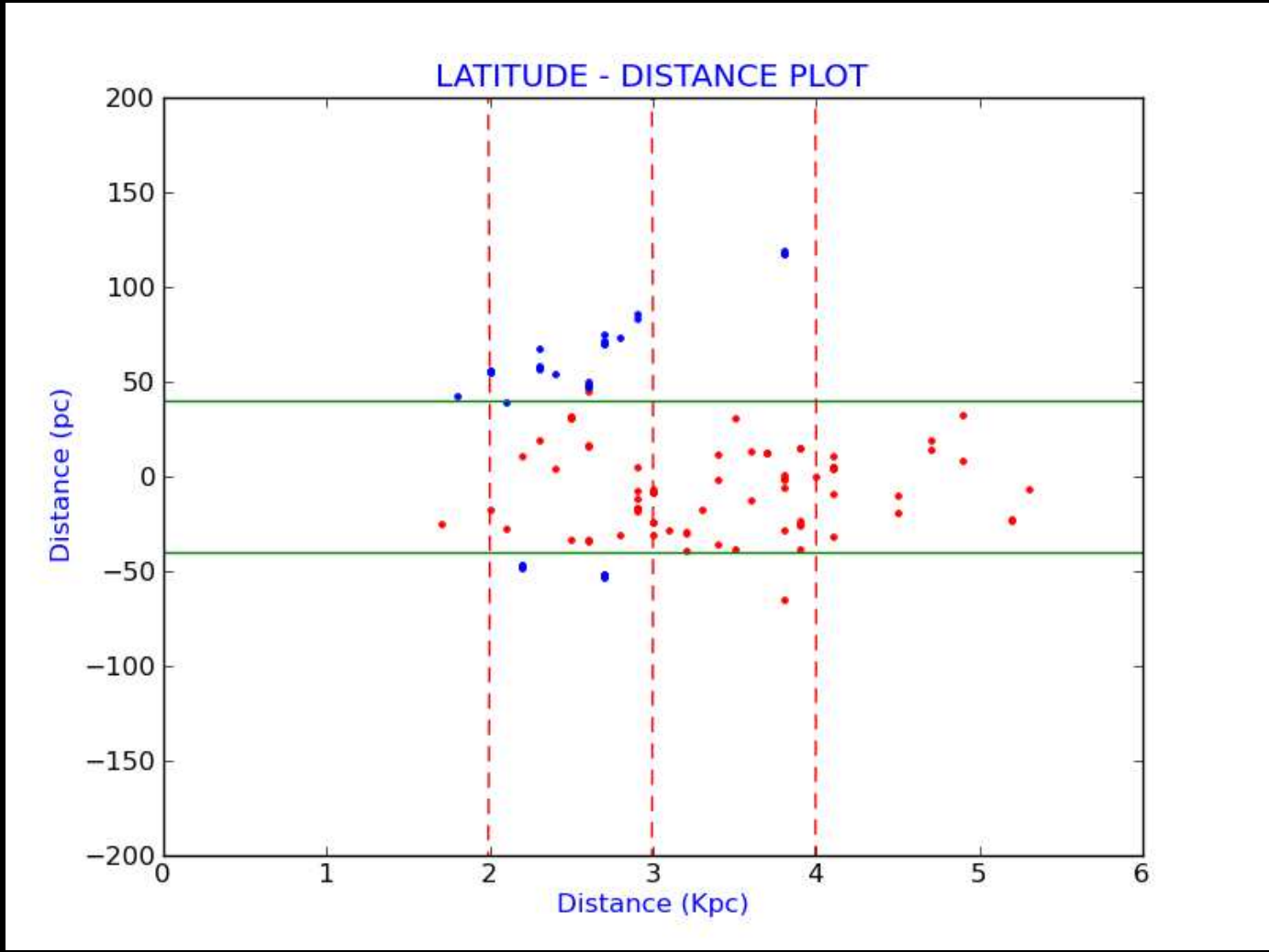
RESULTS SO FAR



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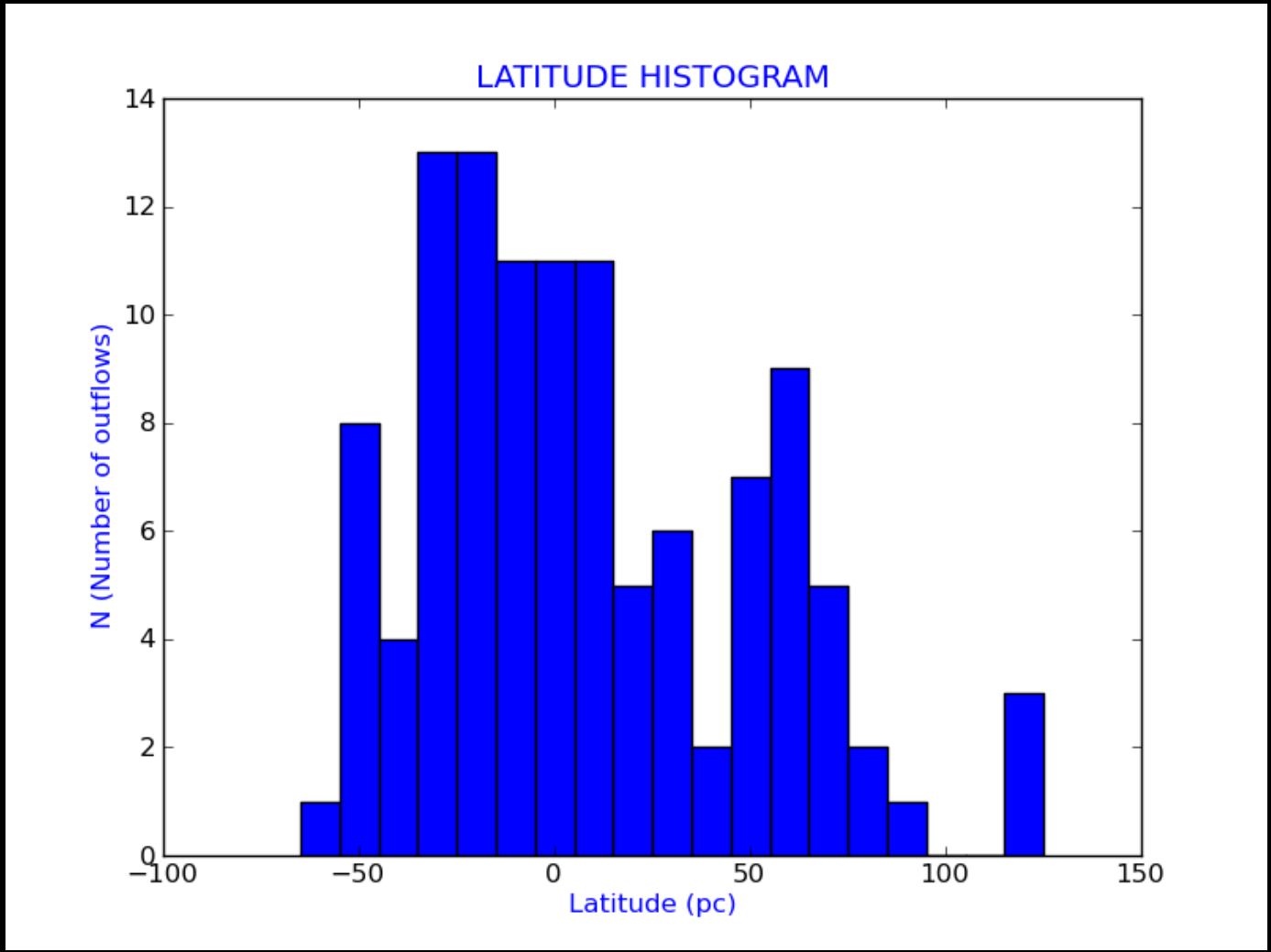
RESULTS SO FAR



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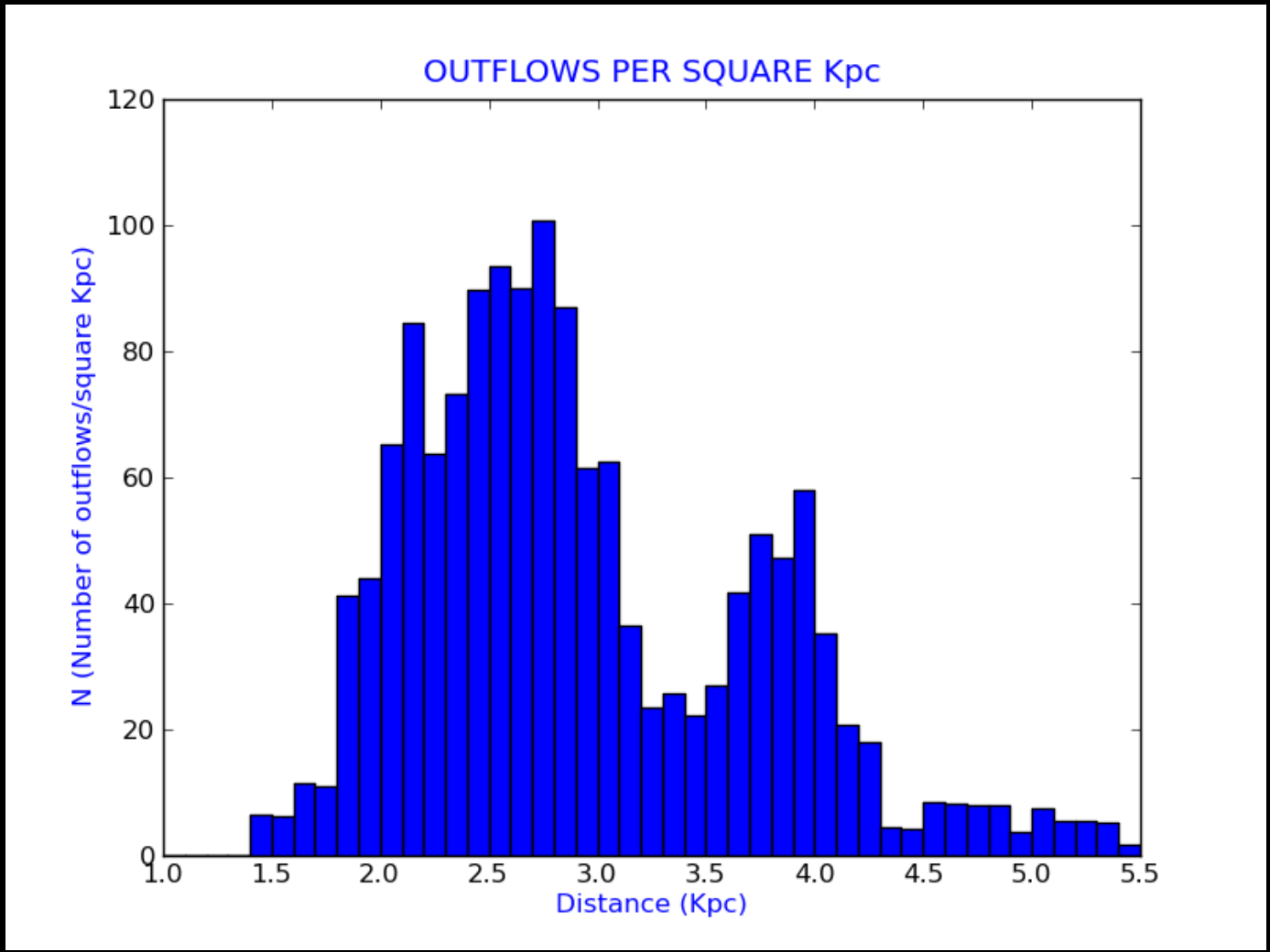
RESULTS SO FAR



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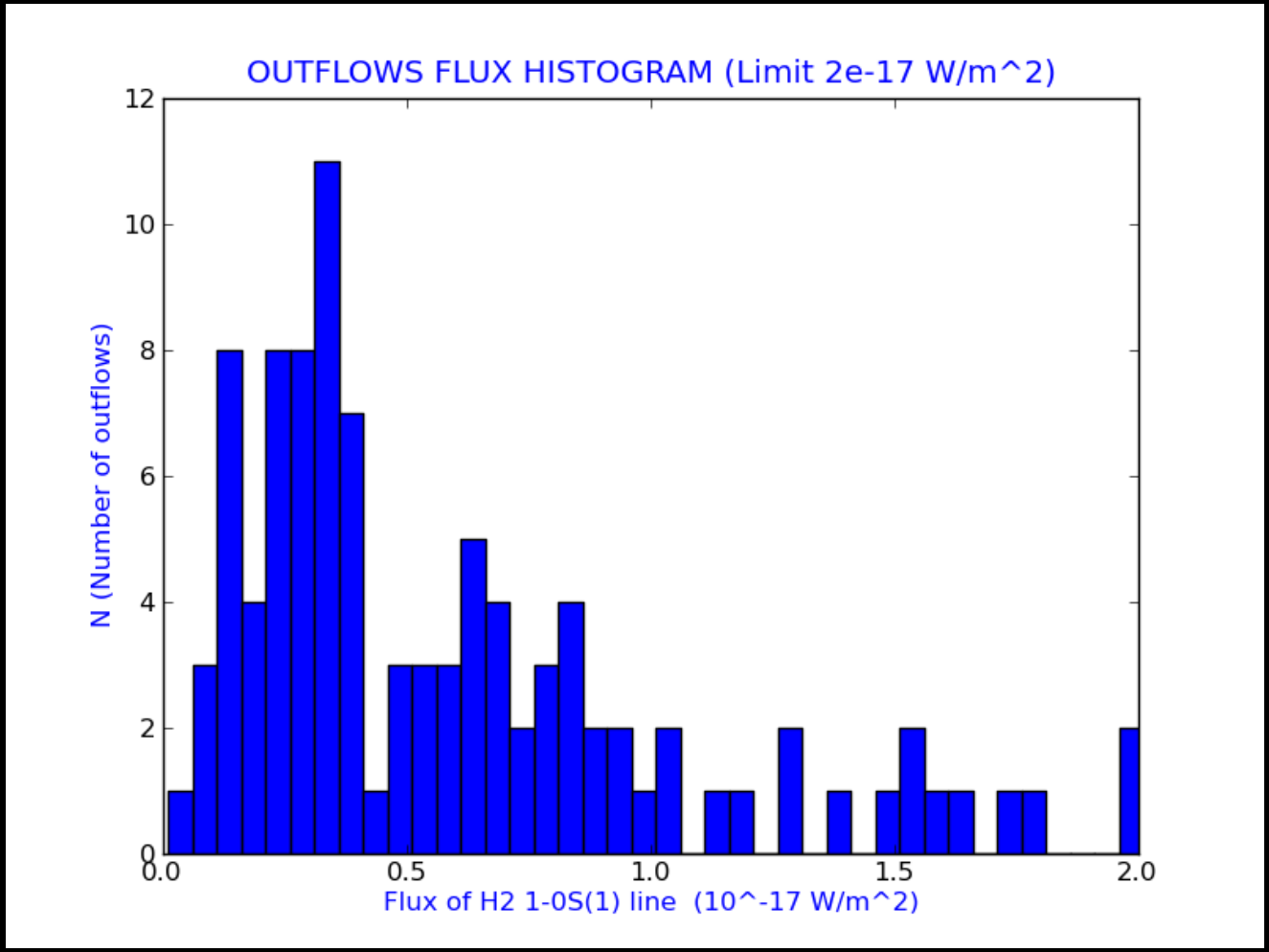
RESULTS SO FAR



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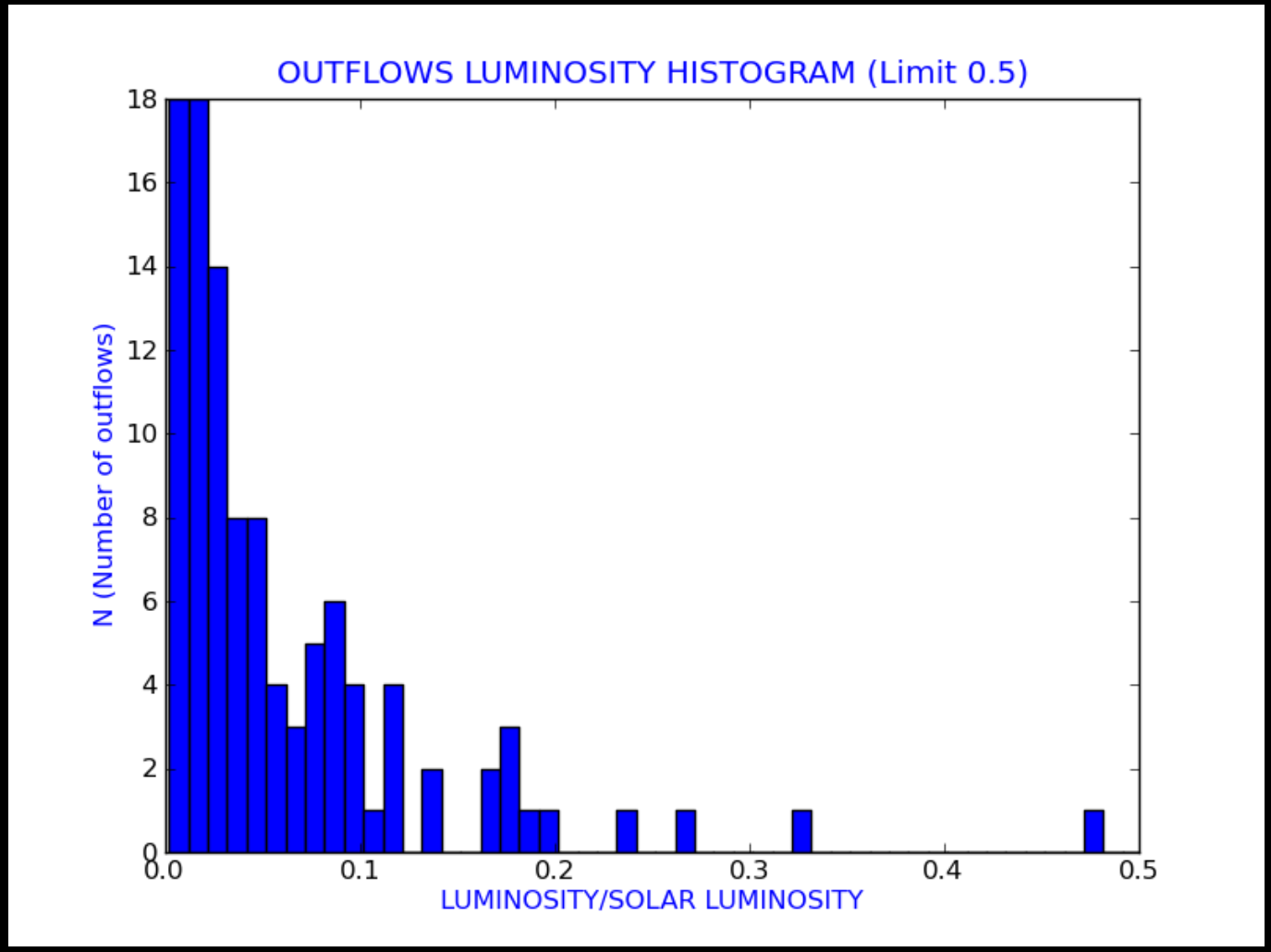
RESULTS SO FAR



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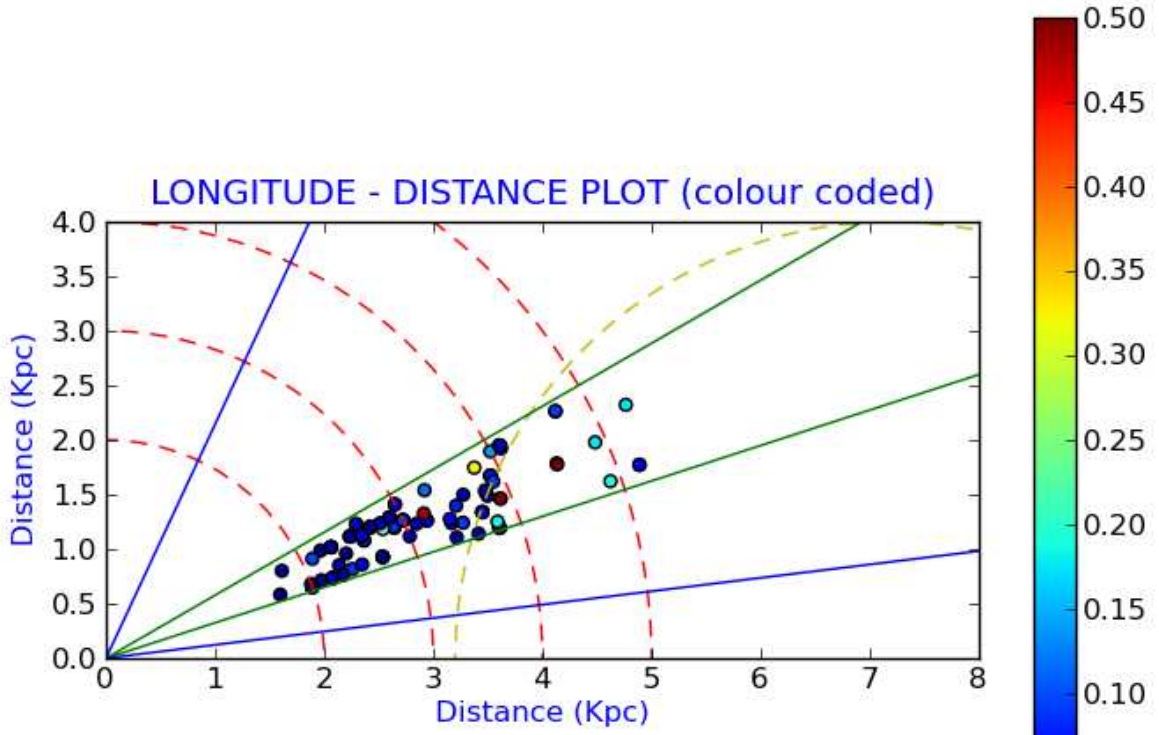
RESULTS SO FAR



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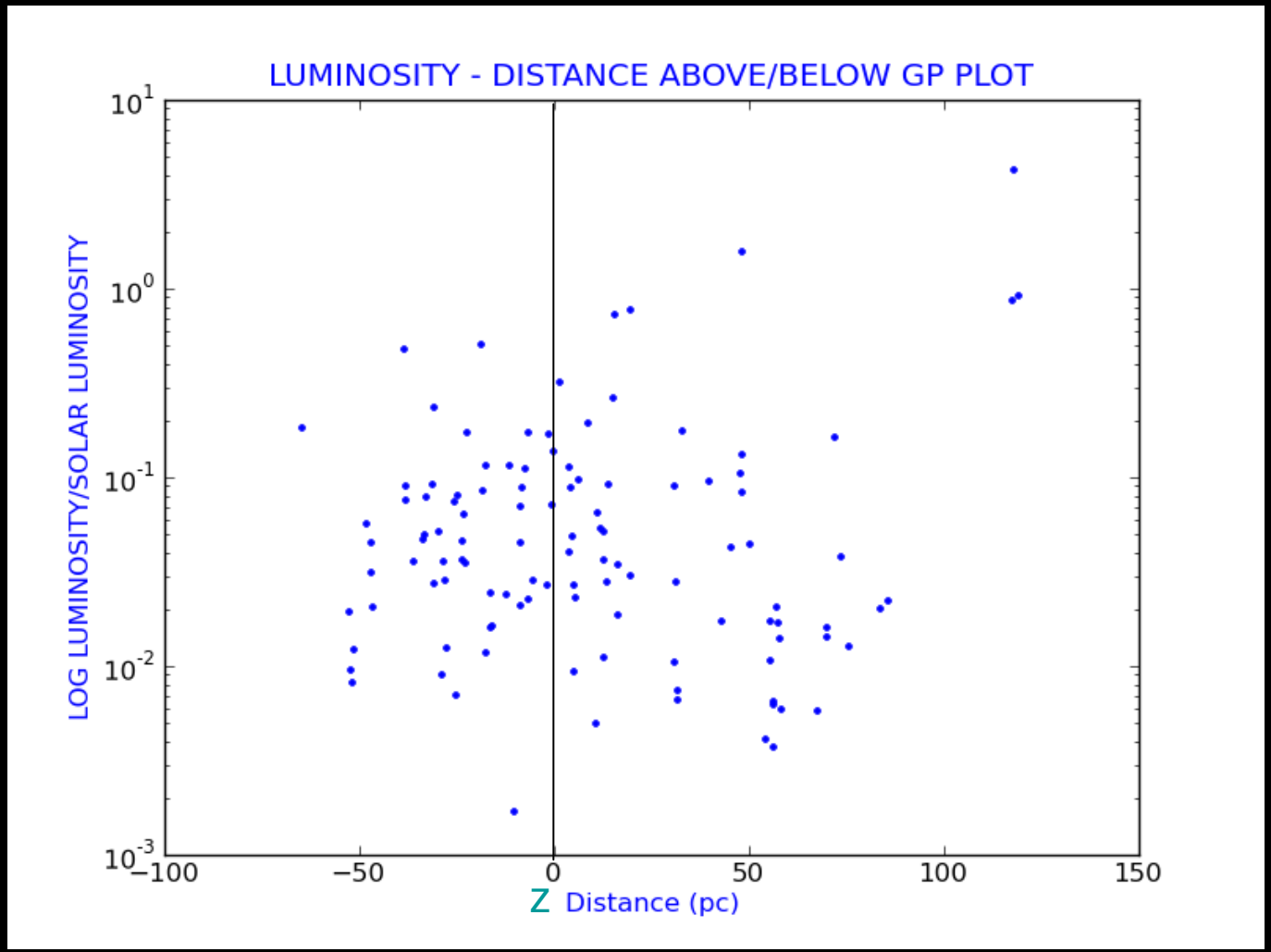
RESULTS SO FAR



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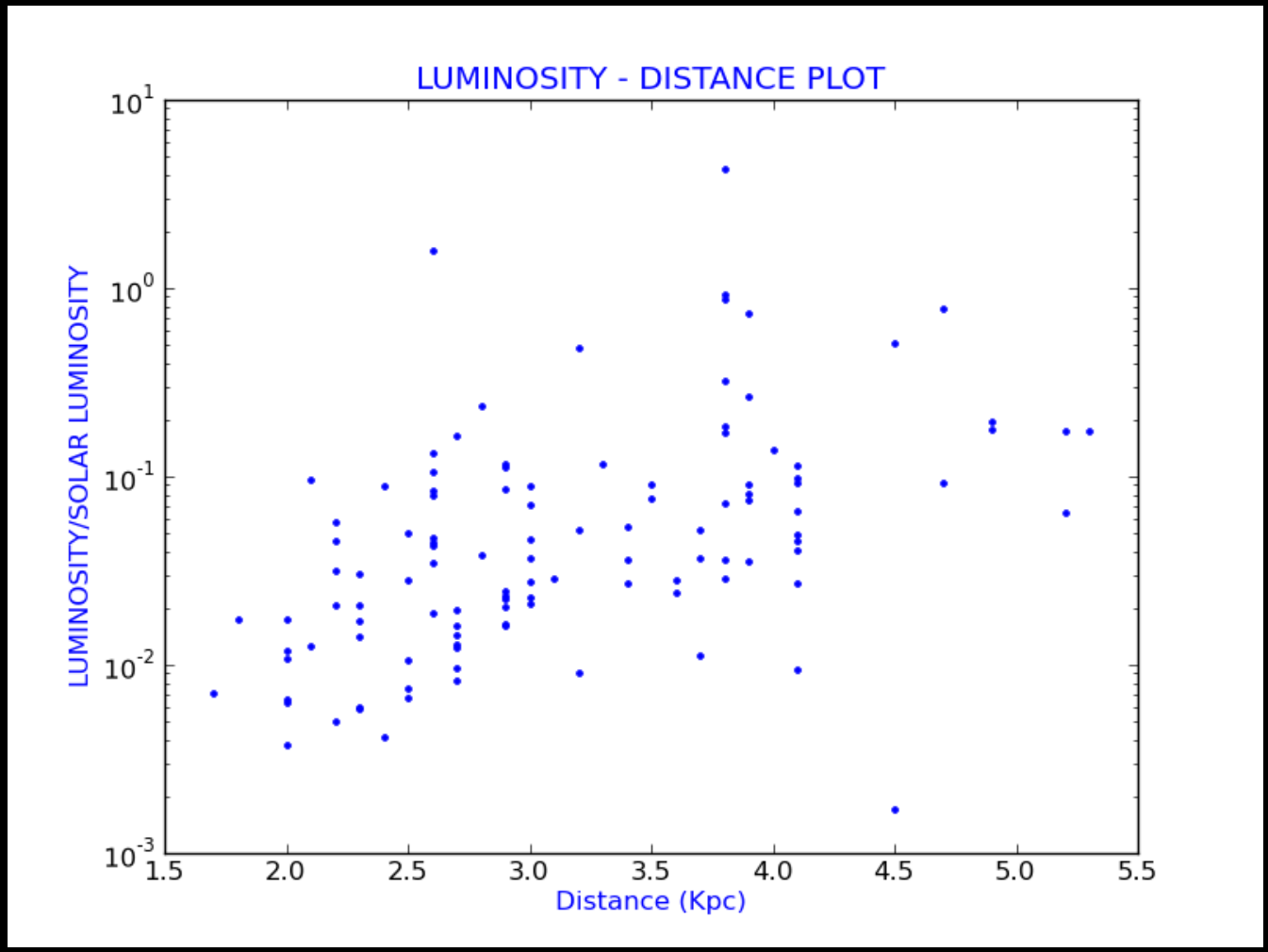
RESULTS SO FAR



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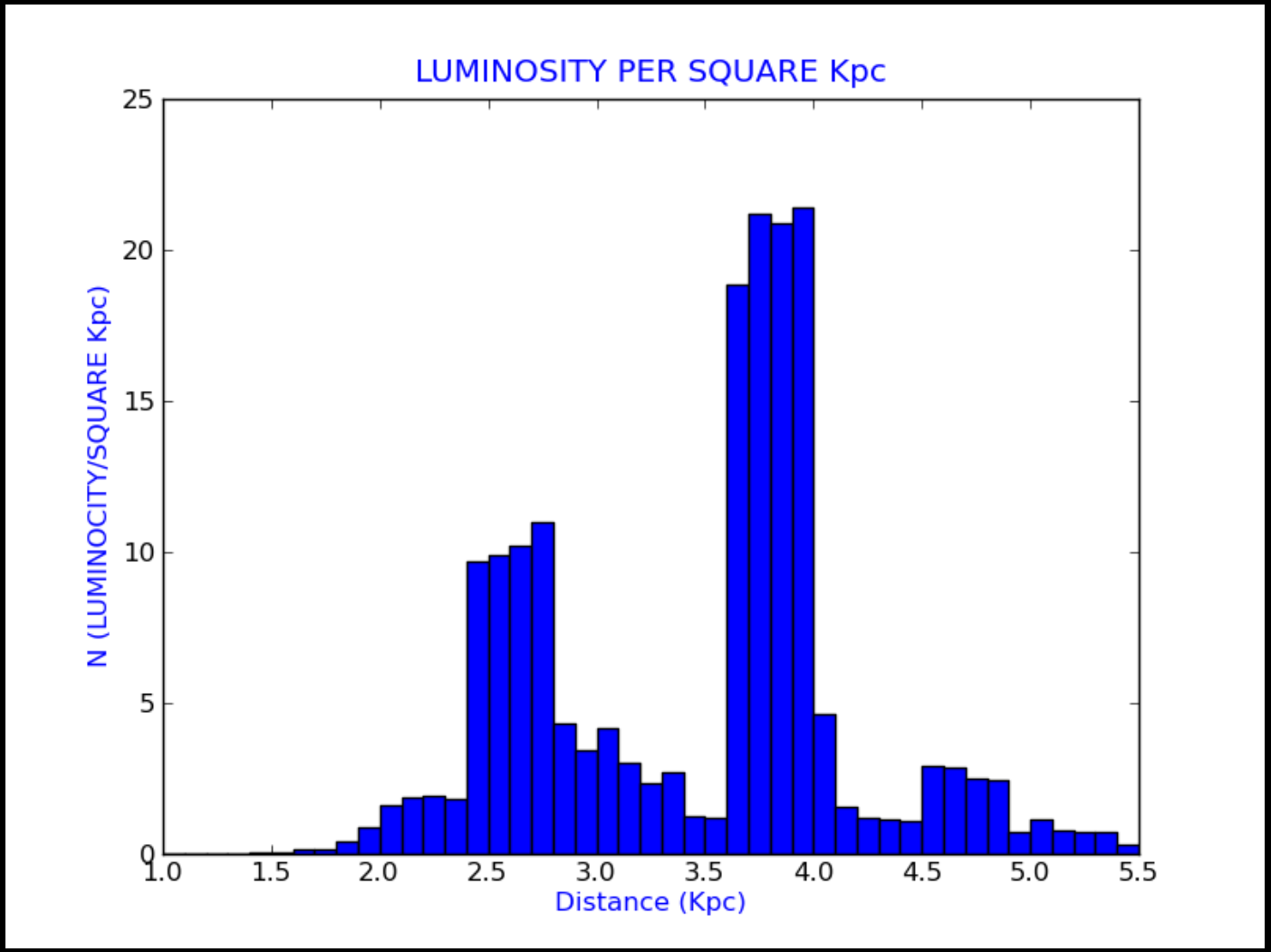
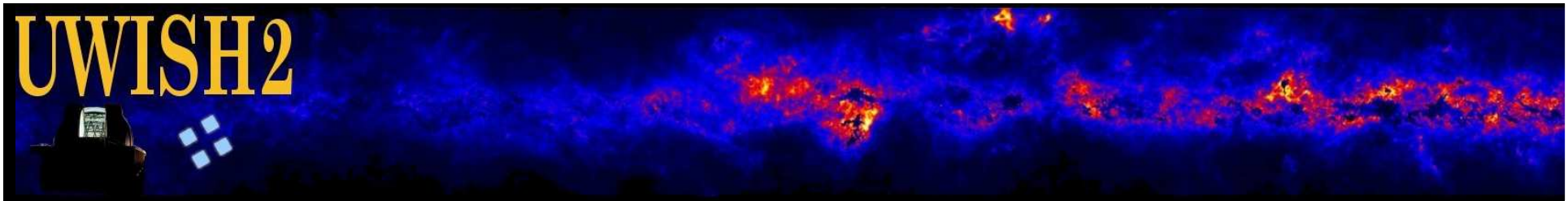
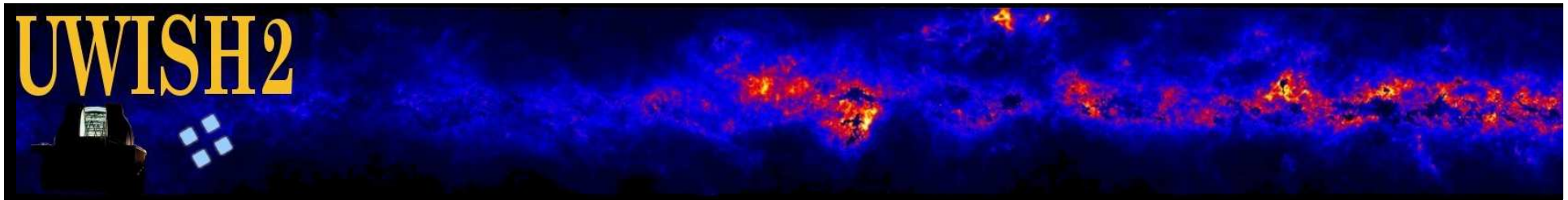
RESULTS SO FAR





FUTURE WORK

- Jets morphology
- Position angles and length of jets
- Source properties (mass, luminosity, age, accretion rates)
- How jet properties relate to source properties?
- Cloud properties (mass, structure)
- Associate outflows with cloud cores – what percentage of clouds show active forming areas
- Fraction of sources with jets/outflows - duration of the jet/outflow phase in YSO evolution
- Is the star formation isolated or clustered?
- Determine mass accretion rate – Star formation rate



FUTURE WORK

EXTEND THIS WORK TO

ALL UWISH2 SURVEY