




RCW 38: *A Spitzer & Chandra View*

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A bronze statue of a muscular figure, possibly a personification of Earth or a celestial body, holding a globe of the Earth above its head. The statue is set against a bright blue background.

Spitzer IRAC
3.6, 4.5, 8.0 μm
[B,G,R] image of the
central core of this
southern hemisphere
cluster.

RCW 38

Vital Statistics

- Distance ~ 1.7 kpc
- HII Region
- Central Star: IRS2, O5
- Previously ~ 360 YSOs identified
- Deeply embedded cluster of YSOs
- Bubble ~ 0.1 pc



Observations

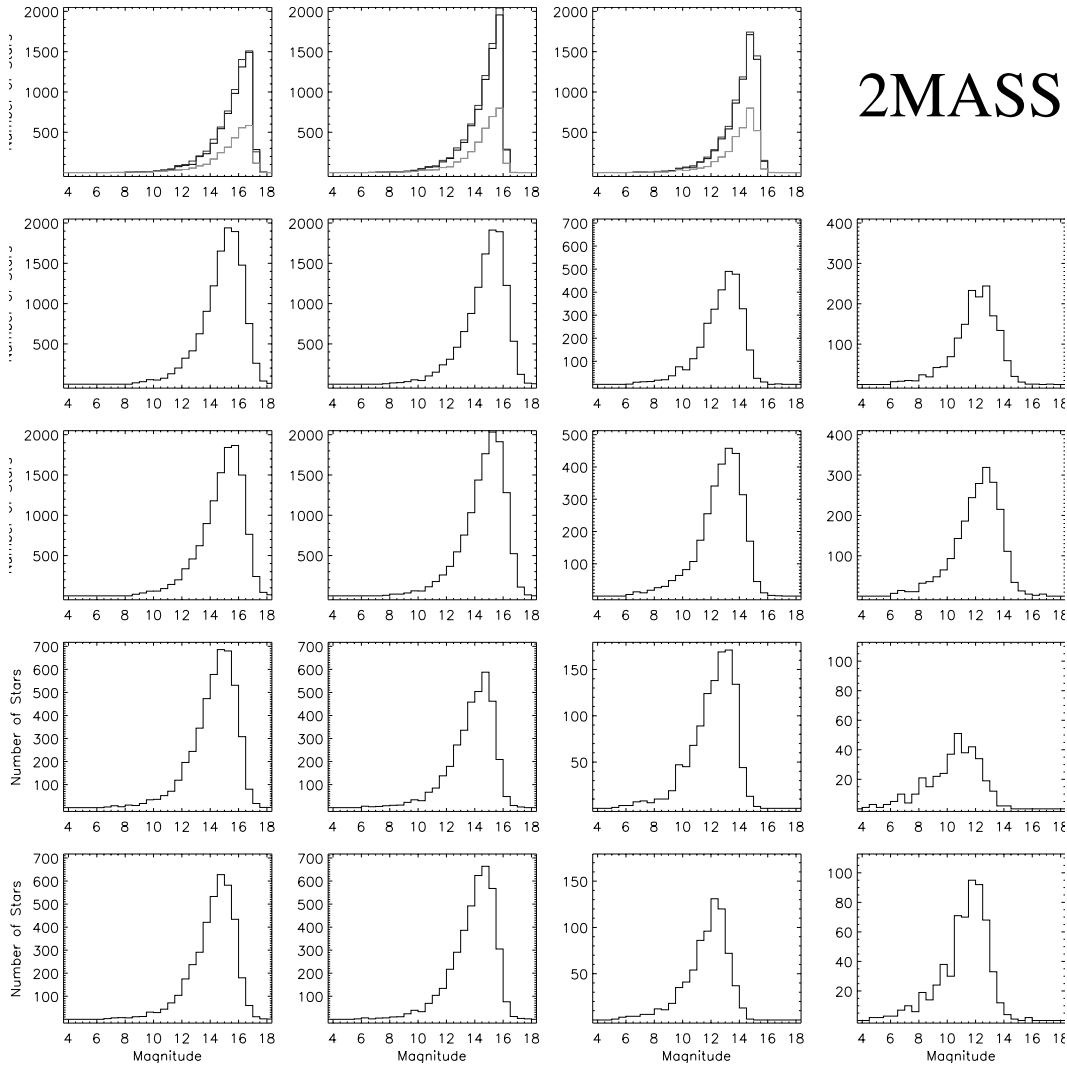
- IRAC bands: 3.6, 4.5, 5.8, 8.0 μm
- MIPS data is saturated
- Four epochs: 2 of each field
- Core & Extended Field: 1 /year
- *Chandra* ACIS-I: 96 ks exposure of centre
- 2MASS: J, H, K near-IR bands

YSO Catalogue



- Epoch 1 & 3: ~17,000 detections
- Epoch 2 & 4: ~6,000 detections
- Variability across the 4 (2) epochs
- X-ray Emission & IR detection in >2 bands
- Contaminant Removal: AGN , PAHs

2MASS



Ep 1: Field

Ep 3: Field

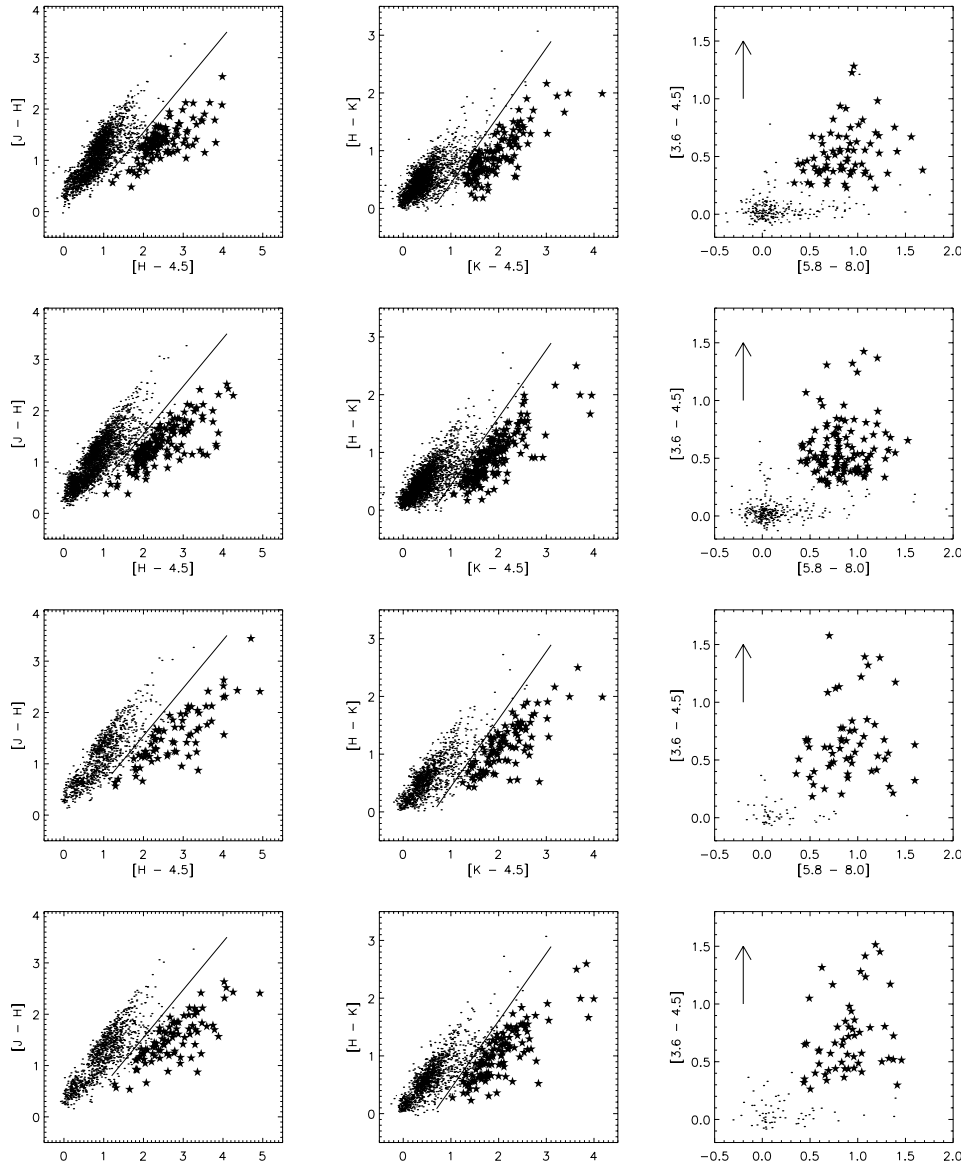
Ep 2: Core

Ep 4: Core

Magnitude
Histograms

Core FOV not as deep due to
background/exposure time.





YSO Selection:

$J - H \vee H - 4.5$

$H - K \vee K - 4.5$

$3.6 - 4.5 \vee 5.8 - 8.0$

The Core Epochs have more deeply embedded protostars than the Fields.



YSO Classification

Symbols:

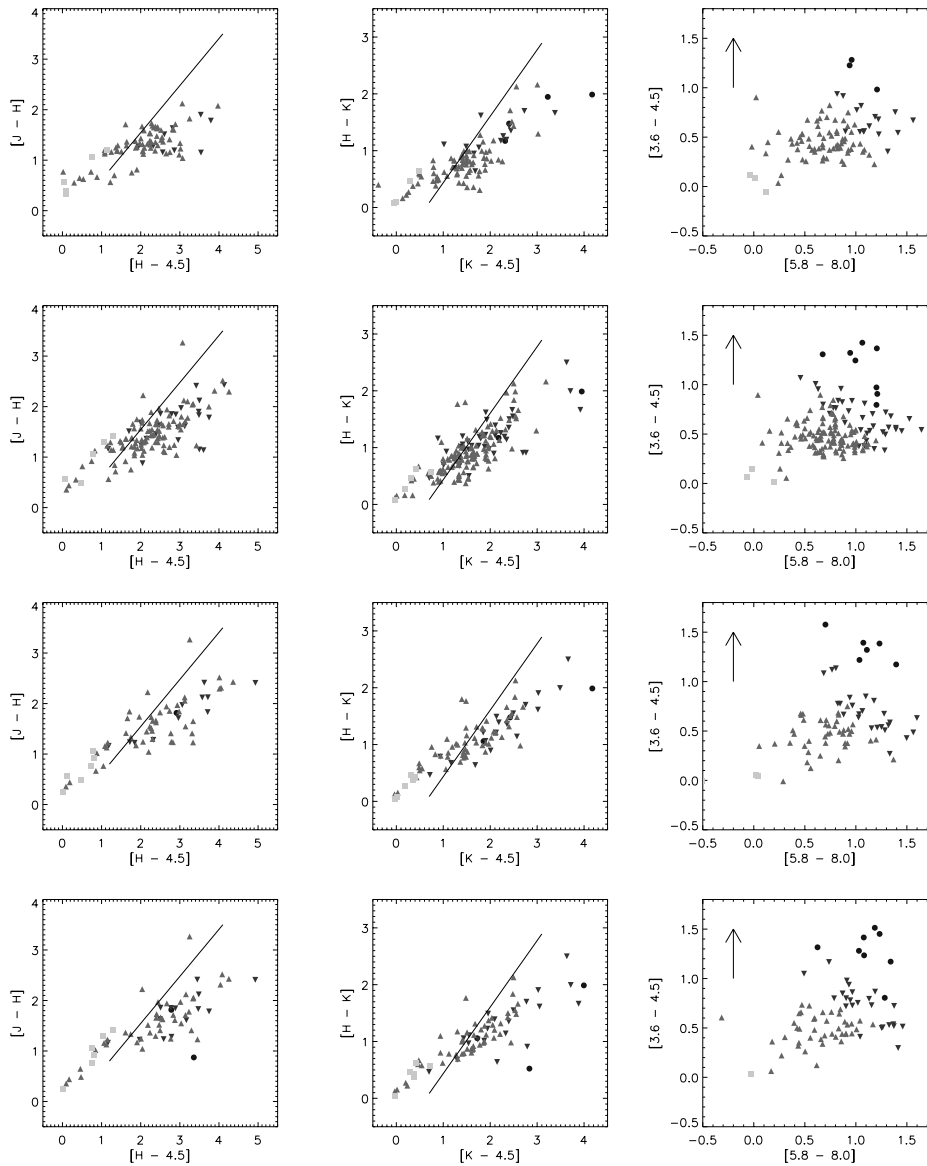
Class 0/I : circles

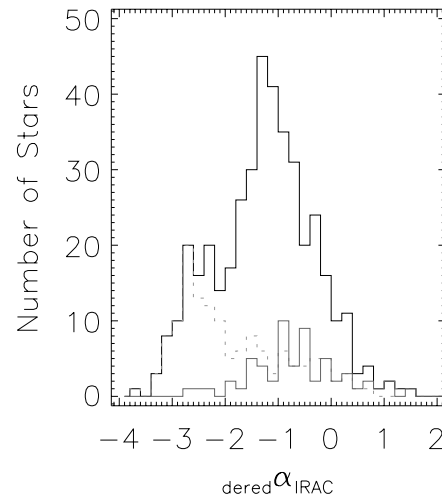
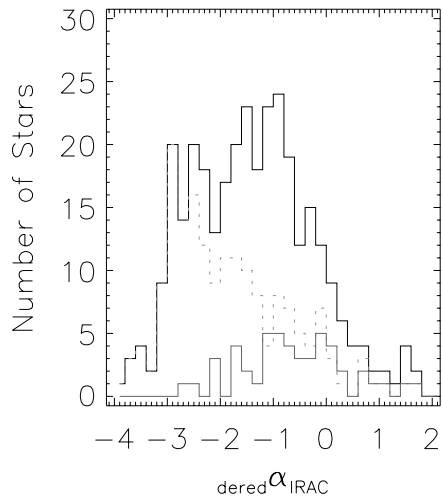
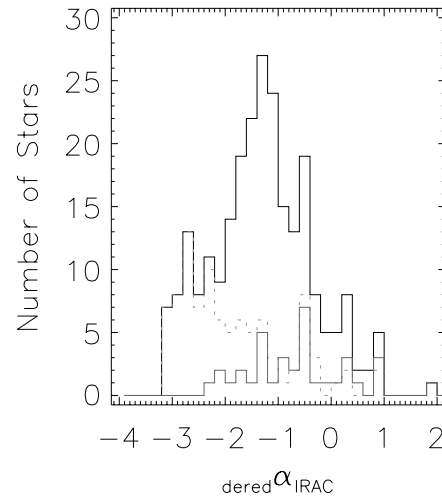
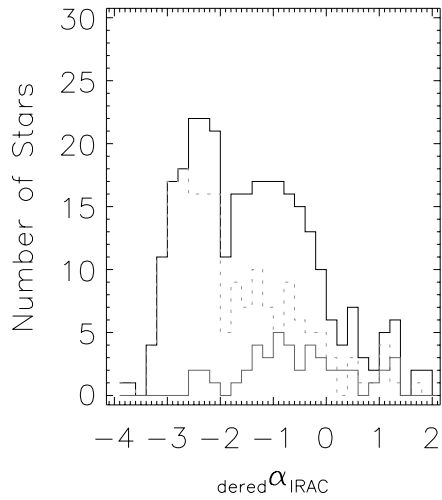
Flat Spectrum: inverted triangles

Class II : triangles

Transition Disks: Diamonds

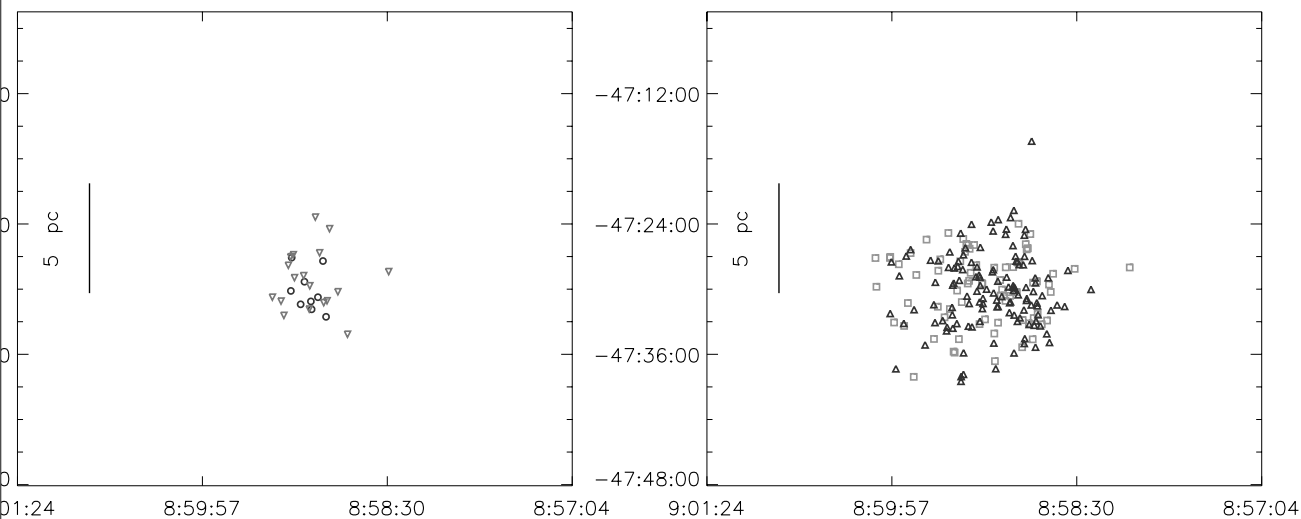
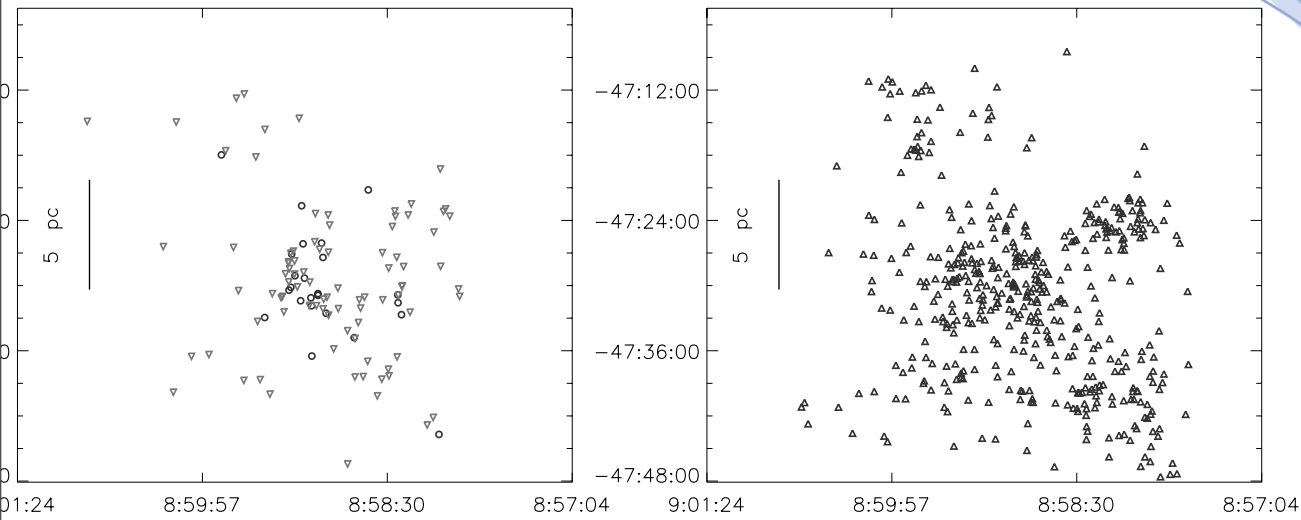
Class III : squares





Class	#	#
0/I	24	9
Flat	88	18
II	461	125
III	74	74





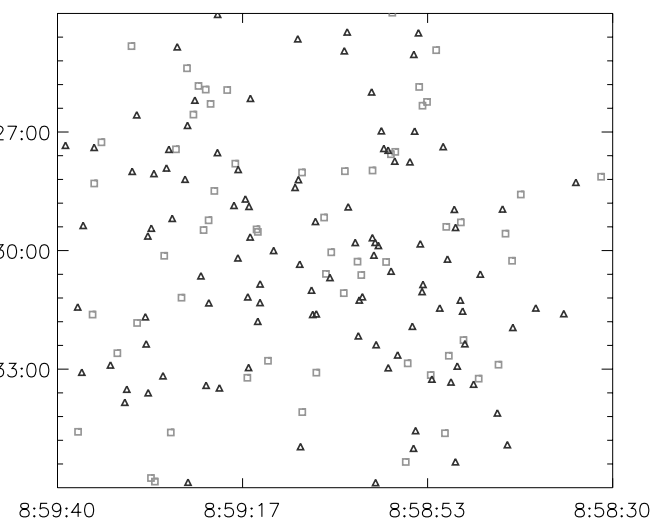
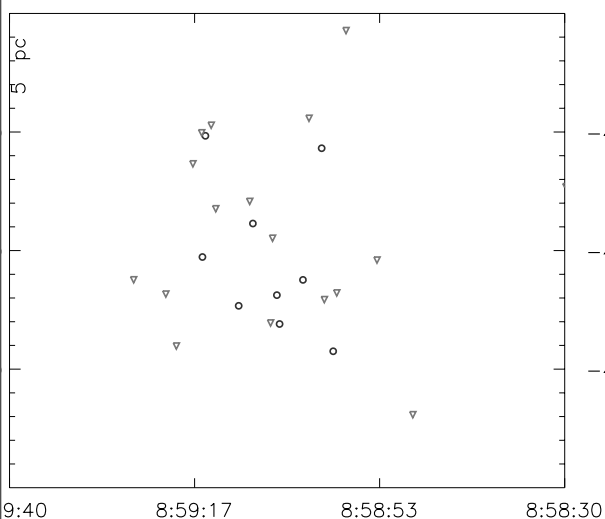
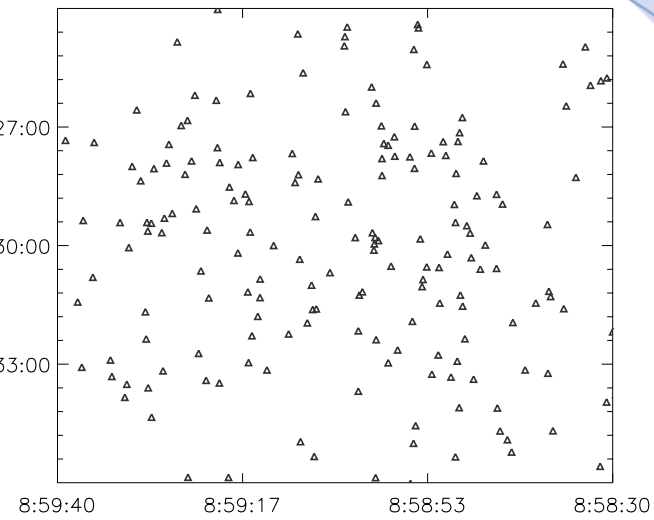
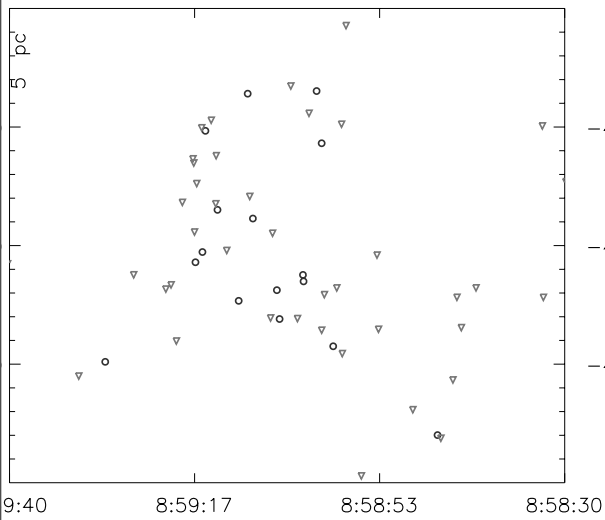
Spatial Distribution (Field)

UL: Protostars

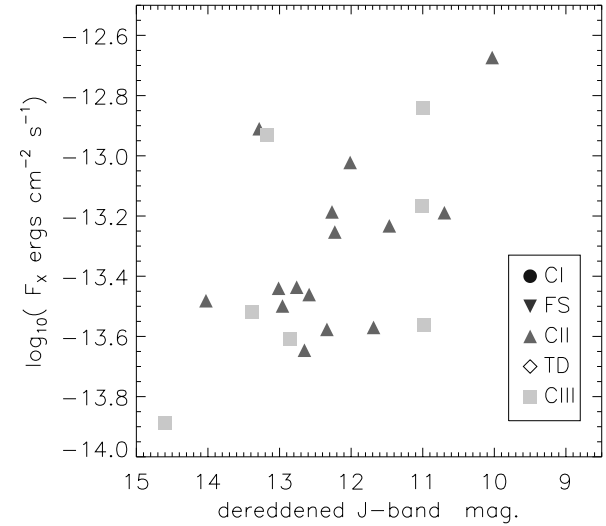
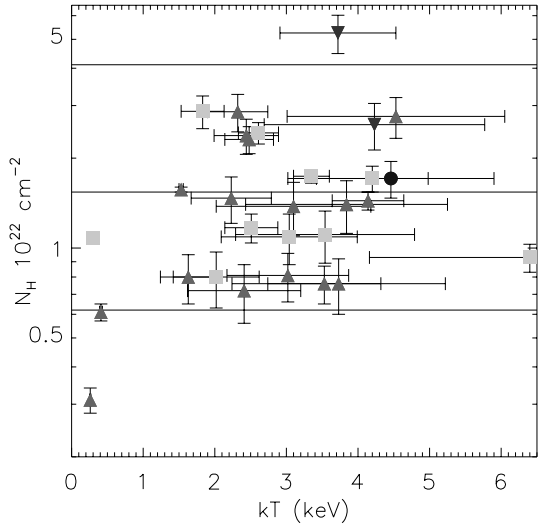
UR: PMS

LL: X-ray Protostars

LR: X-ray PMS

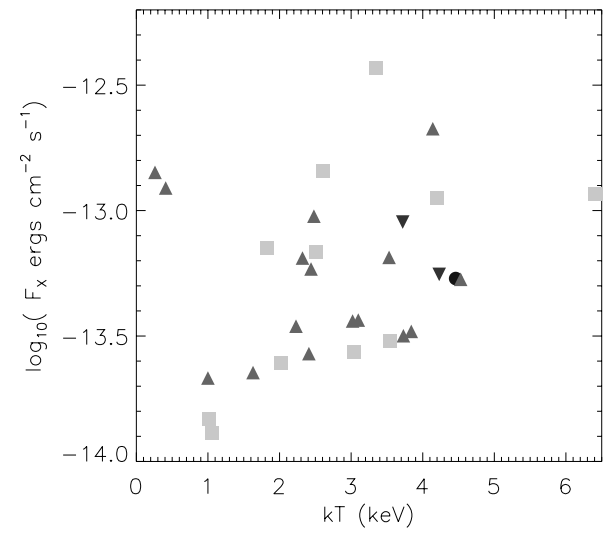
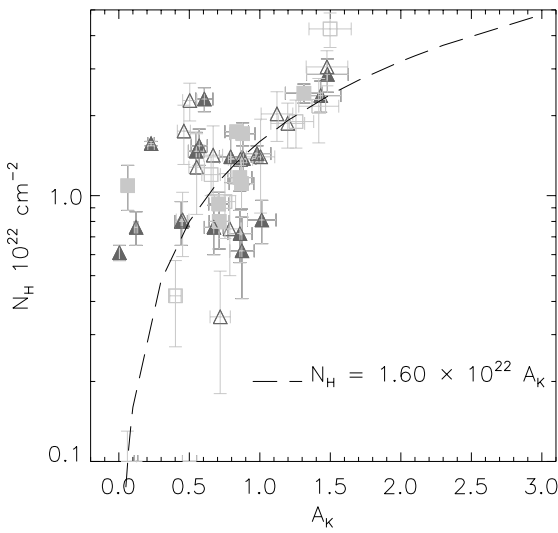


**Spatial Distribution
(Core)**
UL: Protostars
UR: PMS
LL: X-ray Protostars
LR: X-ray PMS



CI 0/I : circles
FlatS: invert triangles
CI II : triangles
TrD: diamonds
CI III : squares

X-ray Properties



Hydrogen Column Density (N_H) to
Plasma Temperature (kT)

X-ray Flux (F_X) to Luminosity
Proxy (mJ)

F_X to Plasma Temperature

N_H to Extinction (A_K)

Conclusions

- RCW 38 rich cluster ~ 650 YSOs
- Protostar Fraction ~ 24%
- Disk Fraction ~ 62%
- Variability studies show ~ 100 stars
- Need Herschel to identify the TDs
- Lot of Work yet to be done!