Science from UKIDSS IV
ROE Edinburgh May 31st - June 1st 2012

Institute for Astronomy

Galactic Clusters Survey: Update

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S Casewell, S Boudreault, …
(on behalf of the GCS WG)

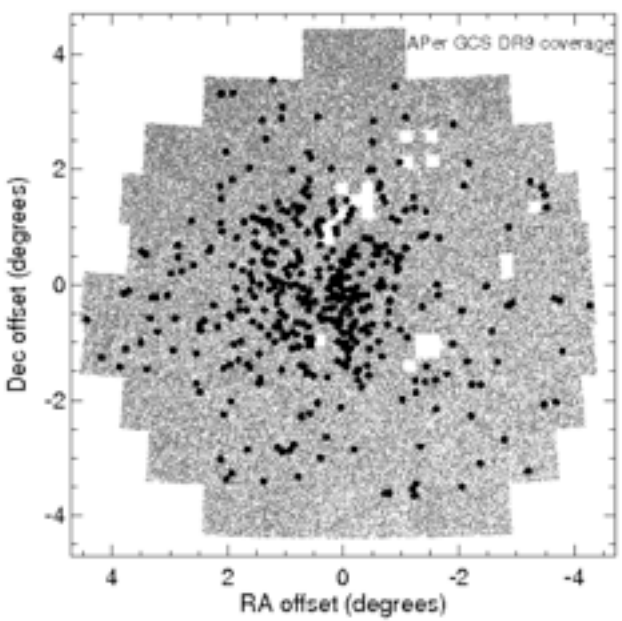
Survey coverage (%)

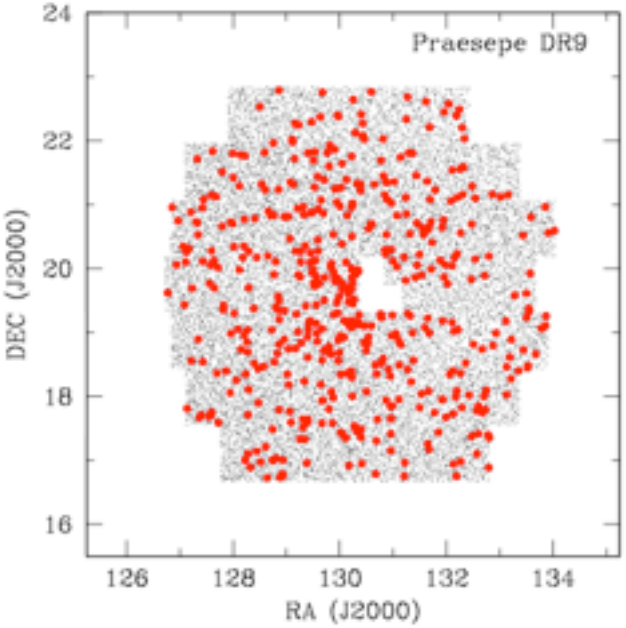
Target	Area deg^2	Z	Y	J	H	K×2
IC-4665	3	100	100	100	100	100
Pleiades	79	95	94	96	89	92
AlphaPer	50	100	100	100	100	100
Praesepe	28	83	82	80	82	82
Tau-Auriga	218	100	100	100	43	100
Orion	154	17	18	18	53	*53
Upper Sco	154	35	34	34	100	100
Perseus OB2	13	100	100	100	100	100
Coma Ber	79	92	91	96	100	100
Hyades	291	7	6	6	4	*100

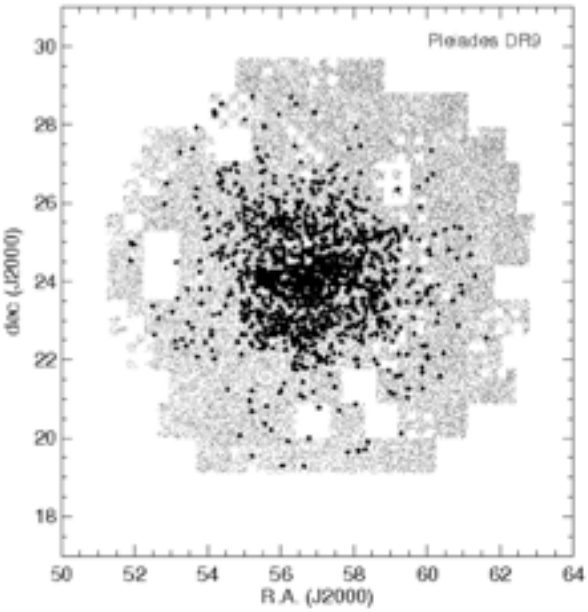
NB:

- includes processed data to end Jan 2012, but QC only to end Jan 2011 (for DR9)
- No K2 in Orion and Hyades suspended
- 77% complete (compared to original plan) as at April 2012.

Coverage (cont.)

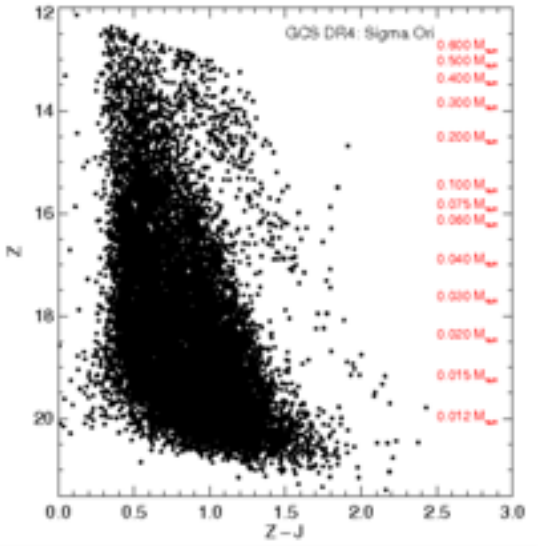


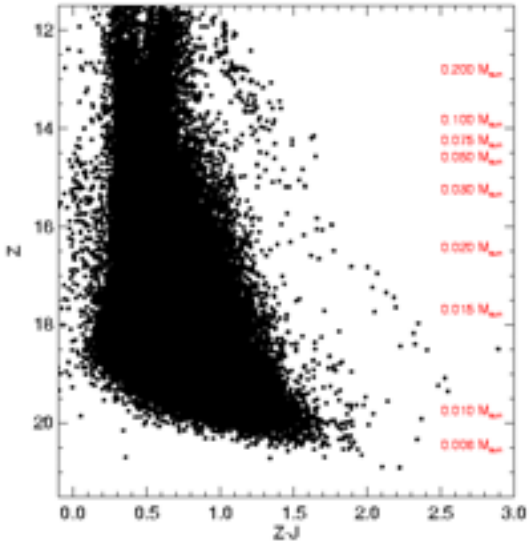


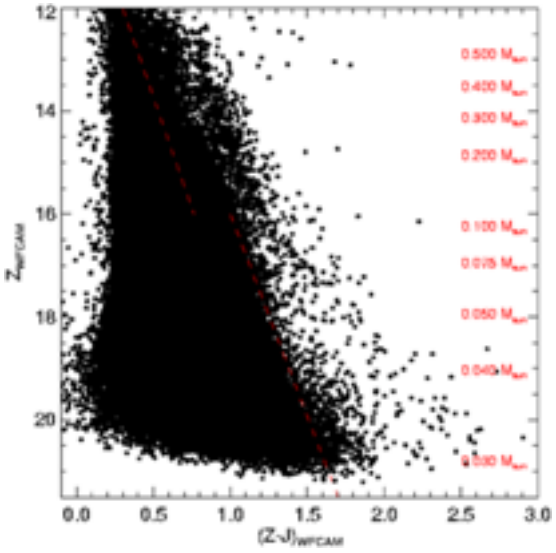


- Good DR9 coverage (as at end Semester 10B)
- Some gaps being filled (up to 12A)
- More extensive coverage than legacy optical photographic surveys
- Much larger samples than deep pencil-beam surveys

Cluster VLMS/BD sequences

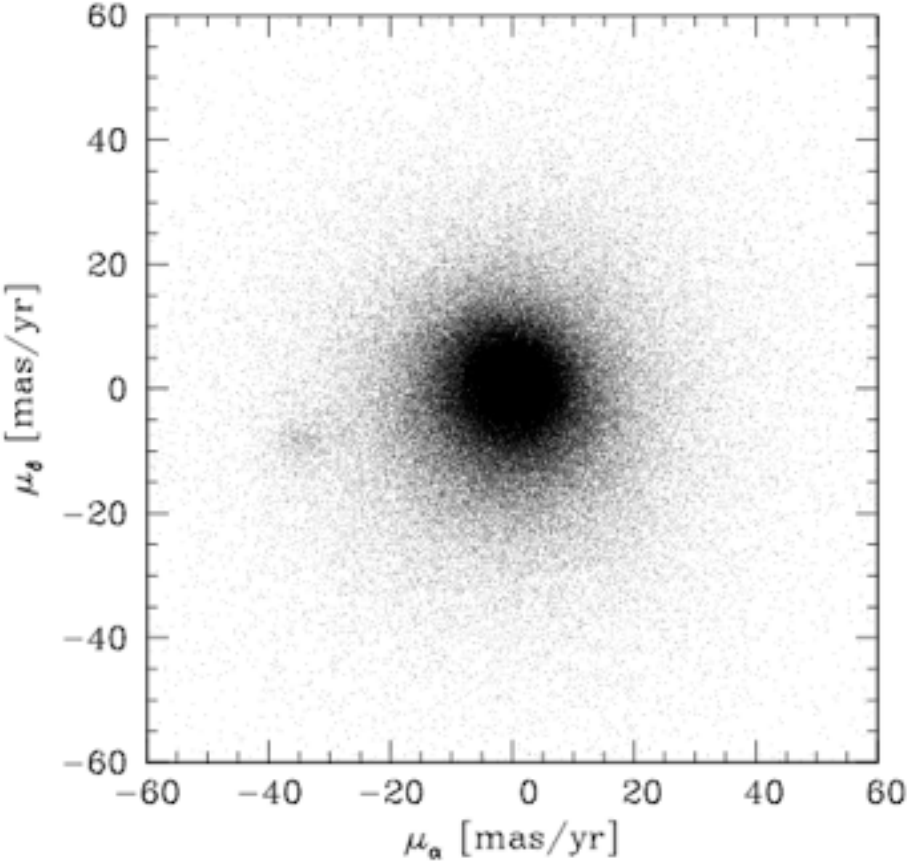






Ages: ≥1 Myr ~10 Myr ~100 Myr

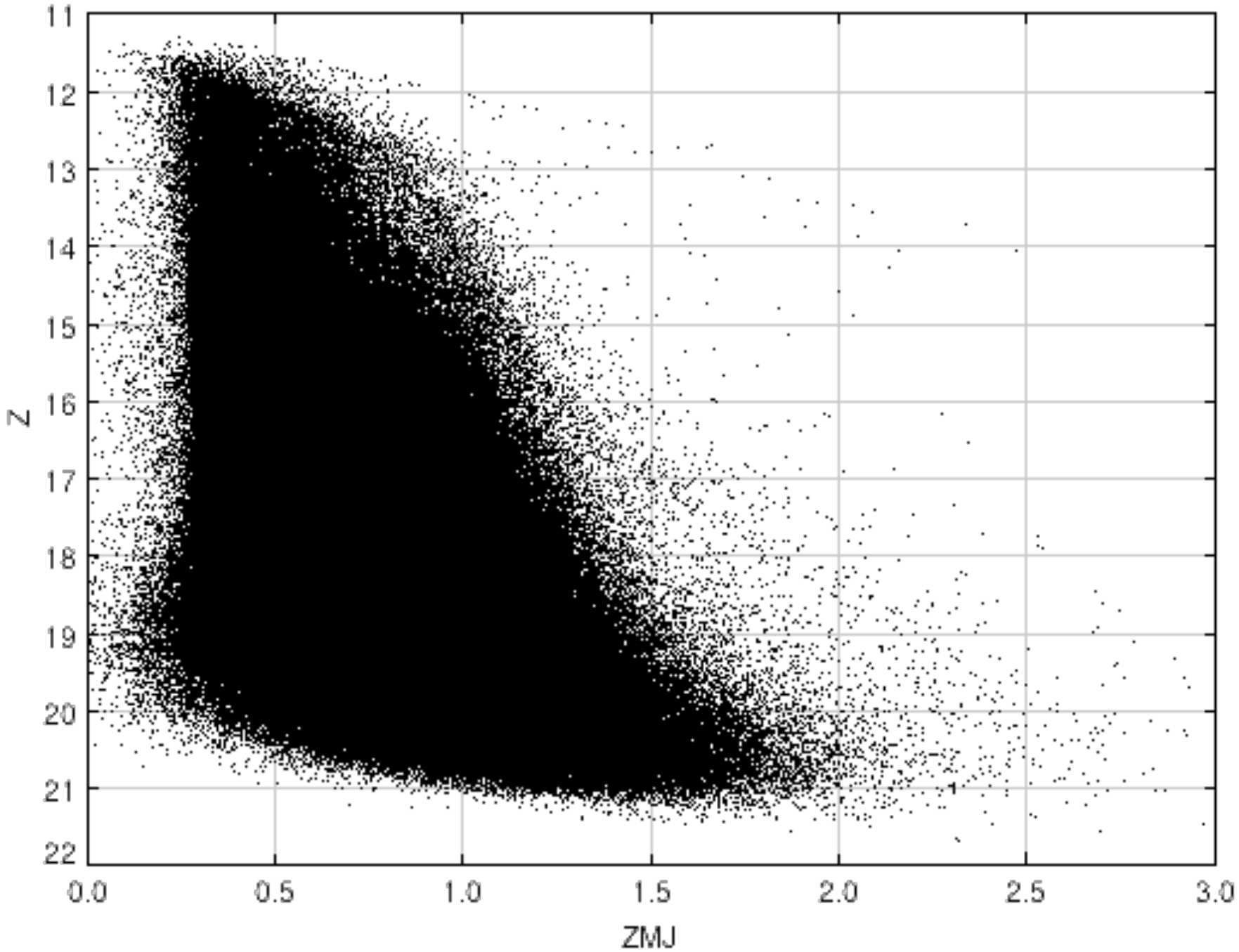
New in DR9: proper motion selection

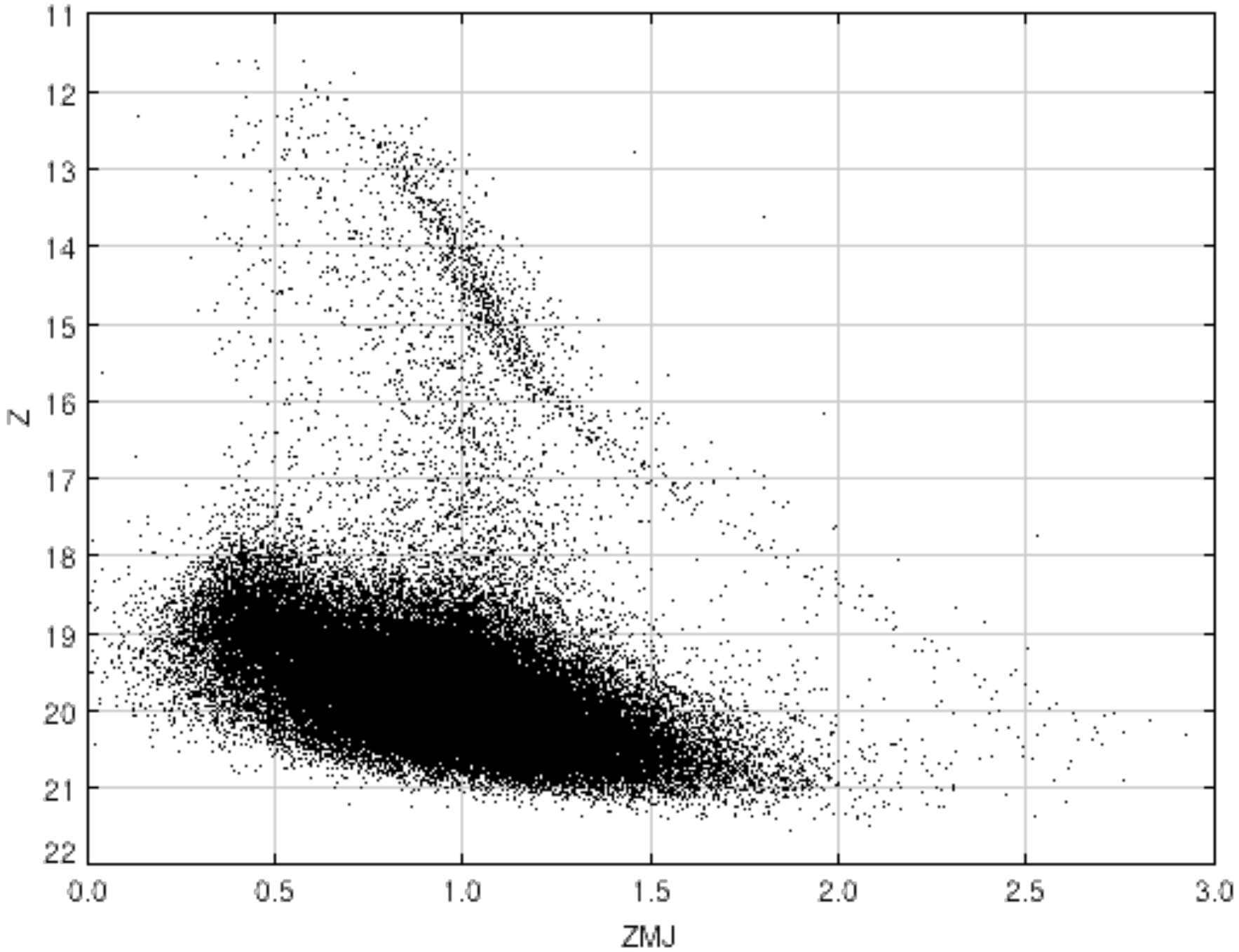


e.g. Praesepe

- Cluster members exhibit distinct proper motion
- Dispersion in proper motions as low as 4 mas/yr

- add in a predicate of the form
  … AND ABS(muRa – muRa0) < 3*sigMuRa AND ABS(muDec – muDec0) < 3*sigMuDec


11
12
13
14
15
16
17
18
19
20
21
22
Z
0.0
0.5
1.0
1.5
2.0
2.5
3.0
ZMJ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1.0
1.5
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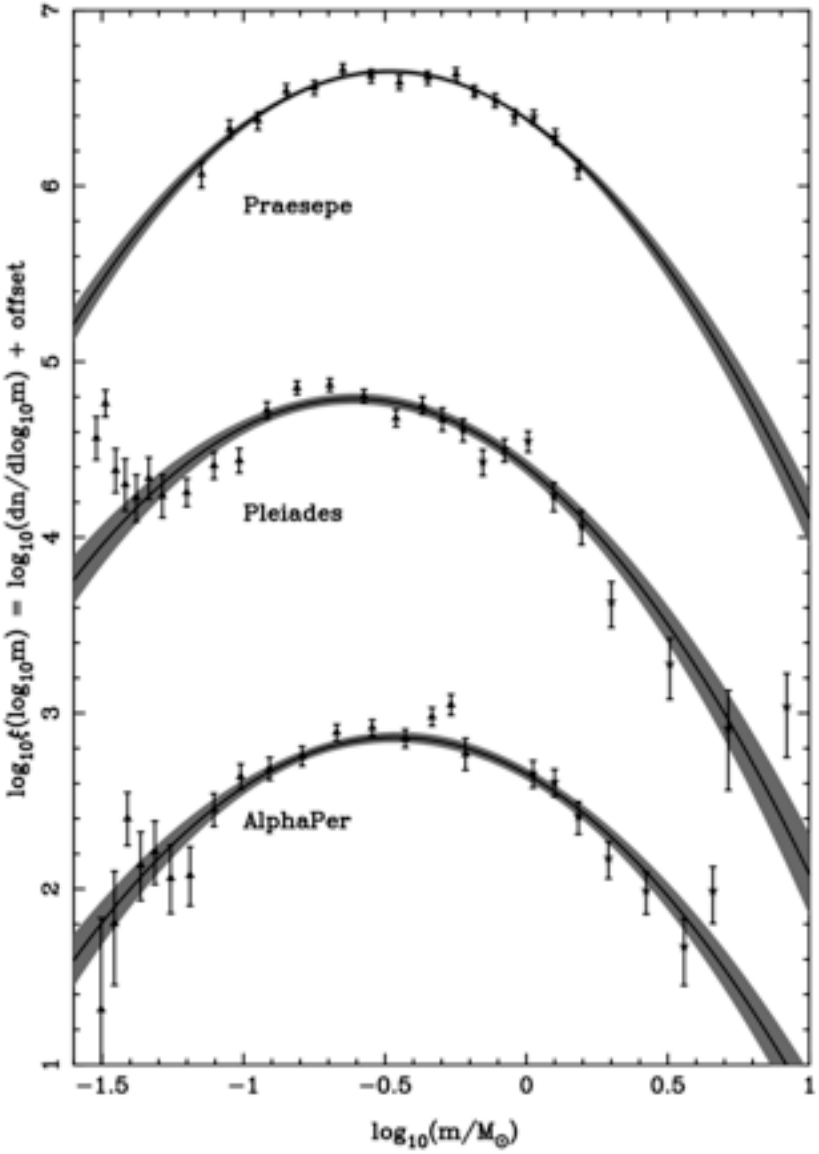
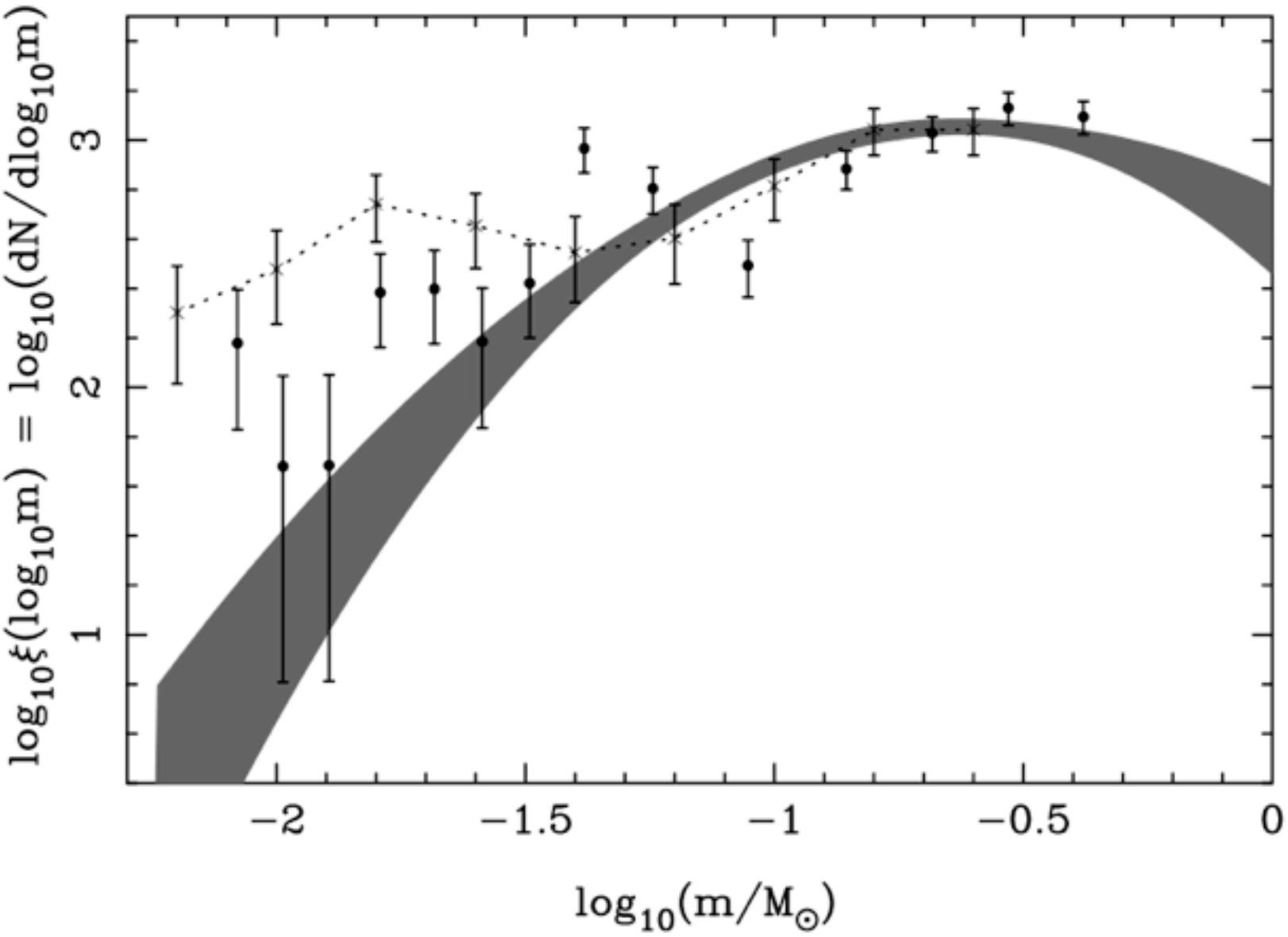
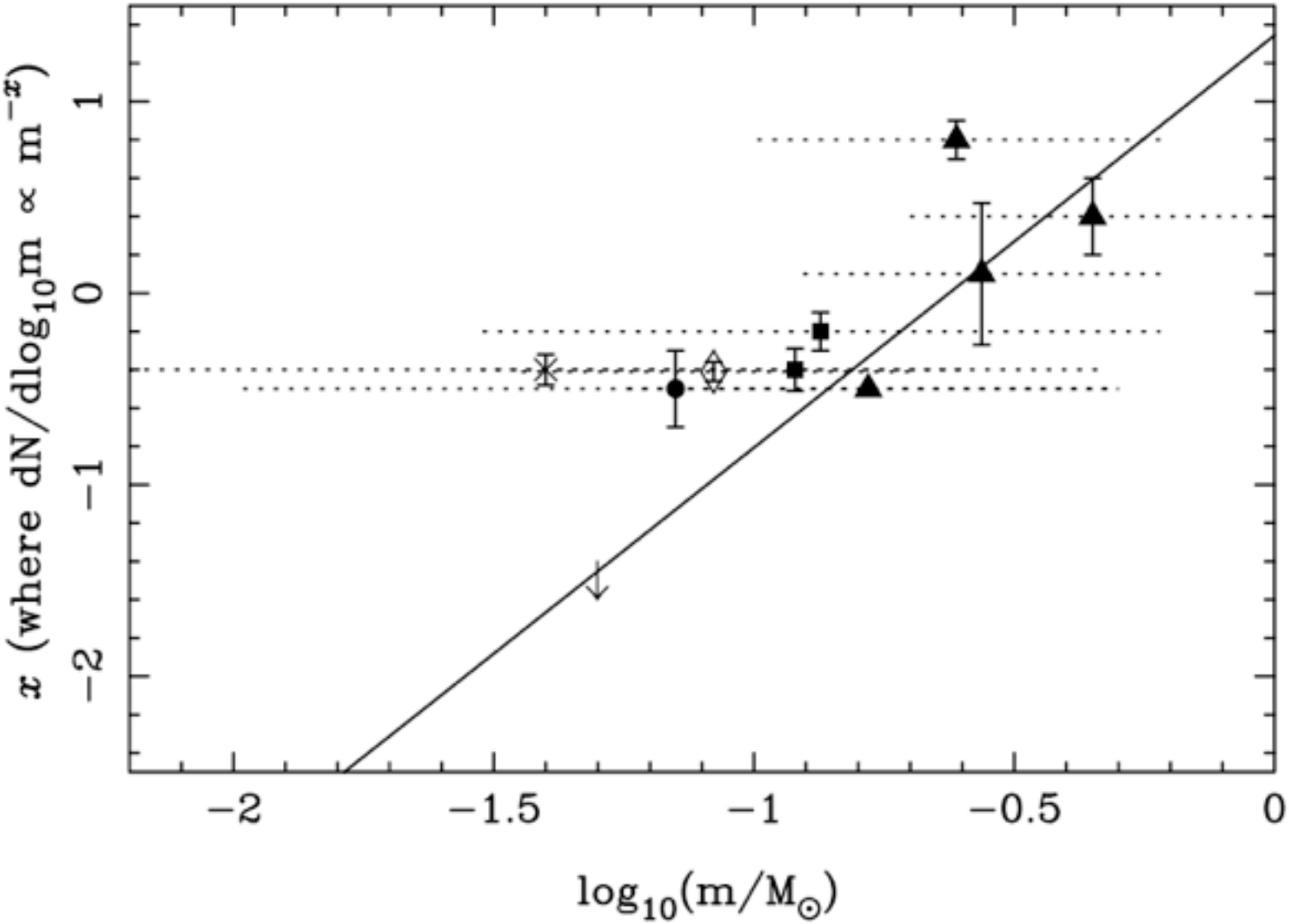
2.5
3.0
ZMJ

Evidence for MF variations…?



Population	Characteristic mass m_C ($M_\odot$)	Dispersion σ	χ^2_ν
Alpha Per	0.344 ± 0.045	0.458 ± 0.019	2.275
Pleiades	0.247 ± 0.047	0.456 ± 0.023	4.382
Praesepe	0.328 ± 0.035	0.434 ± 0.015	0.962
Field (Chabrier 2003)	0.22	0.57	
Field (Chabrier 2005)	0.25	0.55	


$\log_{10}\xi(\log_{10}m) = \log_{10}(dN/d\log_{10}m)$
1
2
3
−2
−1.5
−1
−0.5
0
$\log_{10}(m/M_\odot)$


x (where dN/dlog$_{10}$m ∝ m^{-x})
1
0
−1
−2
−2
−1.5
−1
−0.5
0
log$_{10}$(m/M$_\odot$)

Conclusions

- 5 colour, multi-epoch GCS imaging provides unrivalled datasets for VLMS/BD studies
- Survey completeness is good
- Preliminary evidence for MF variations, but need more sophisticated analysis

To find out more, type “Lodieu, N.” into ADS.