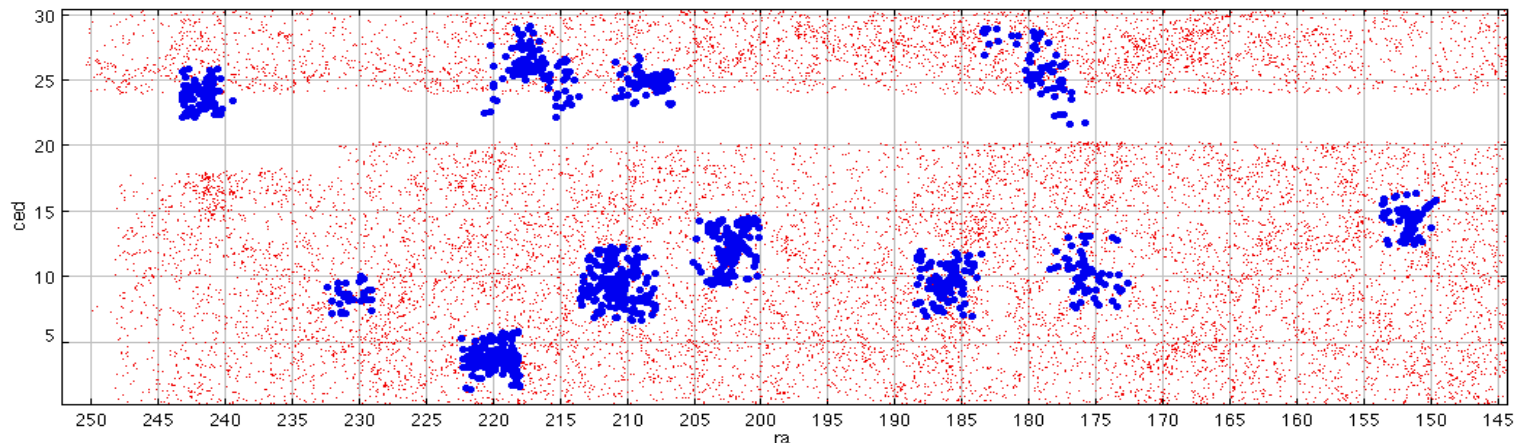


HI Deficiency in the UAT Groups Sample (Using the A57 Catalog)

Mary Crone Odekon, Skidmore College

| | | |
|----------------------------|------------------|---|
| 1) NGC 5846 | 31.2 Mpc | not in a.57, although some data are available |
| 2) AWM 3 /WBL 509 | 75.3 Mpc | near edge of a.57 |
| 3) WBL 368 | 77.6 Mpc | near edge of a.57 |
| 4) MKW 10 | 99.0 Mpc | |
| 5) Zw1400/ NGC 5416 | 101.6 Mpc | |
| 6) MKW 11 | 110.3 Mpc | |
| 7) WBL 404/408 | 113.0 Mpc | |
| 8) MKW 8 | 128.9 Mpc | some RF interference |
| 9) WBL 251 | 137.4 Mpc | RF interference |
| 10) HCG 69 | 138.5 Mpc | RF interference; near edge of a.57 |
| 11) NGC 6107 | 142.7 Mpc | too far north for a.57 |
| 12) AWM 4 | 148.4 Mpc | on edge of a.57 region |
| 13) A2063 | 163.4 Mpc | |
| 14) A2052 | 166.0 Mpc | about 5° from A2063, so regions overlap |

See <http://egg.astro.cornell.edu/alfalfa/ugradteam/uatgroups.php>

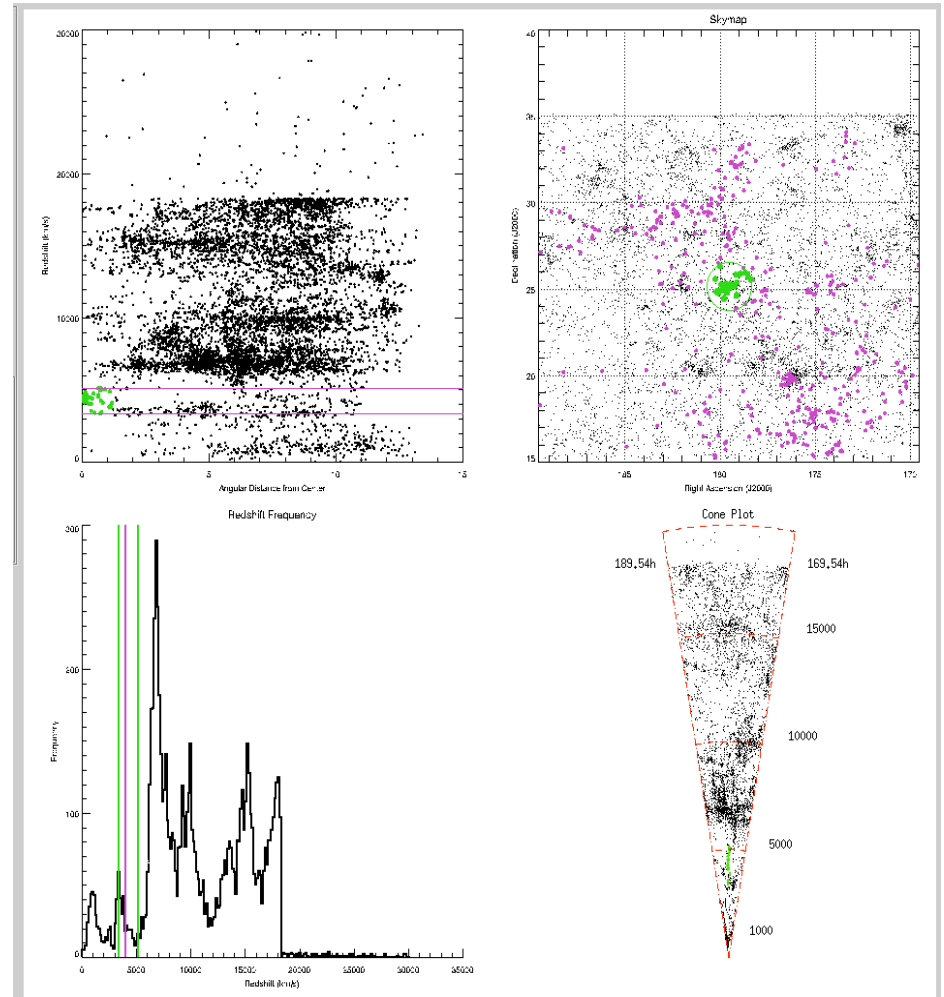


Selection of galaxies in each group

Range in redshift from Group_Membership.pro
(see UGrad Groups Google site)

Range in sky position: 10 Mpc across

| | | |
|-----------------|---------------|-------------|
| Total sample: | 1693 optical, | 642 with HI |
| Inner 1.5 Mpc: | 549 optical, | 130 with HI |
| Annulus 2-5 Mpc | 772 optical, | 311 with HI |



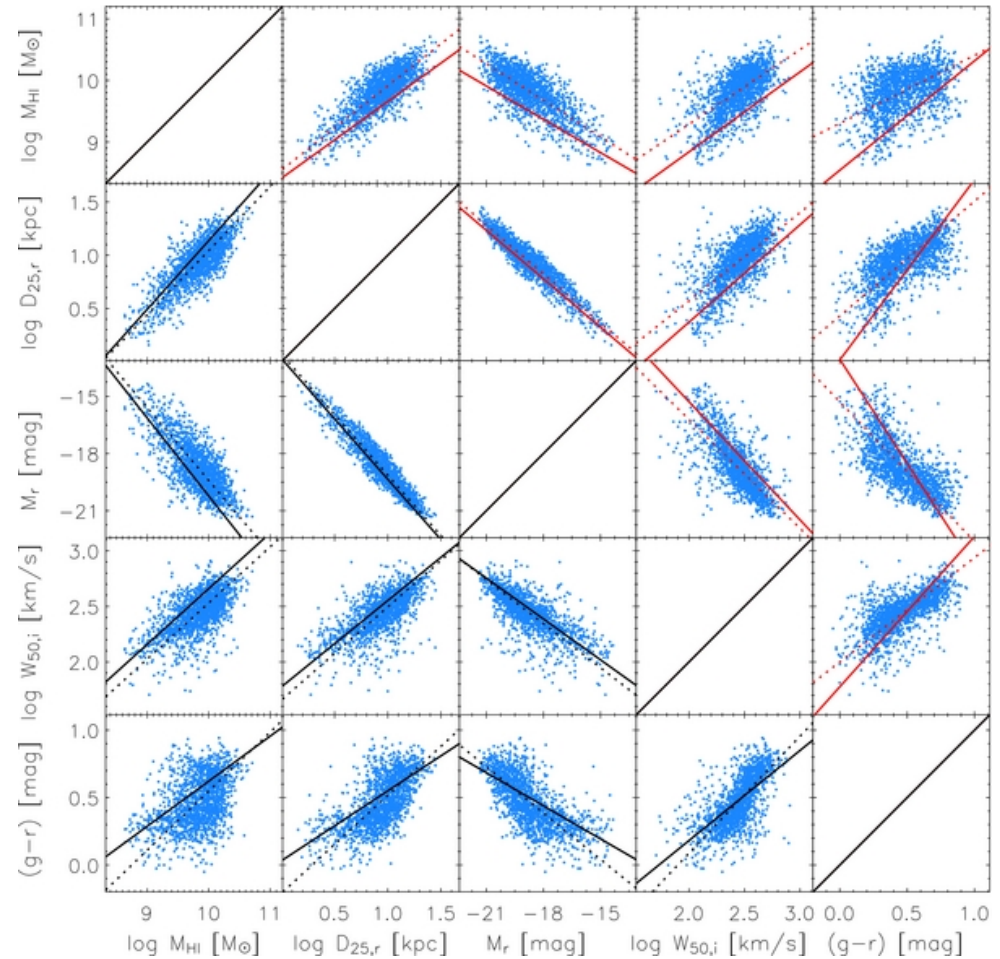
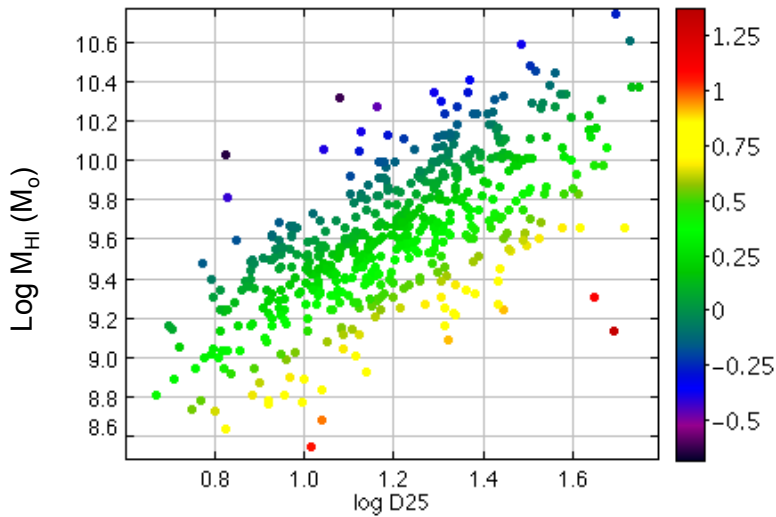
HI Deficiency Calculation

HI CONTENT AND OPTICAL PROPERTIES OF FIELD GALAXIES FROM THE ALFALFA SURVEY. II. MULTIVARIATE ANALYSIS OF A GALAXY SAMPLE IN LOW-DENSITY ENVIRONMENTS

Toribio + 2011

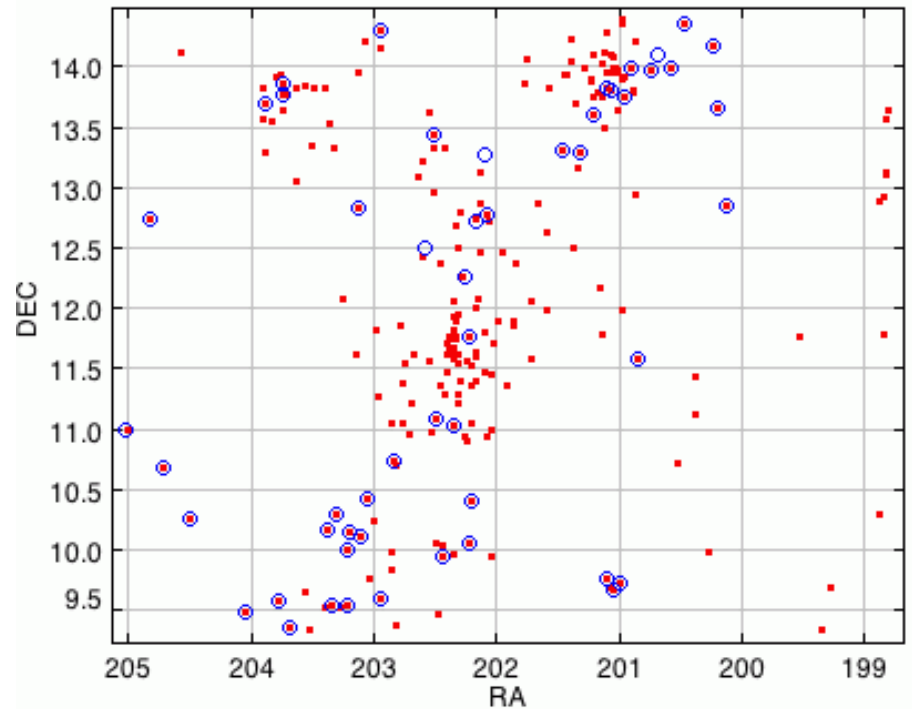
HI Mass is most tightly correlated with $D_{25,r}$ and M_r

The HI Deficiency of a galaxy is defined as the distance below the line of best fit in the top row of this figure.

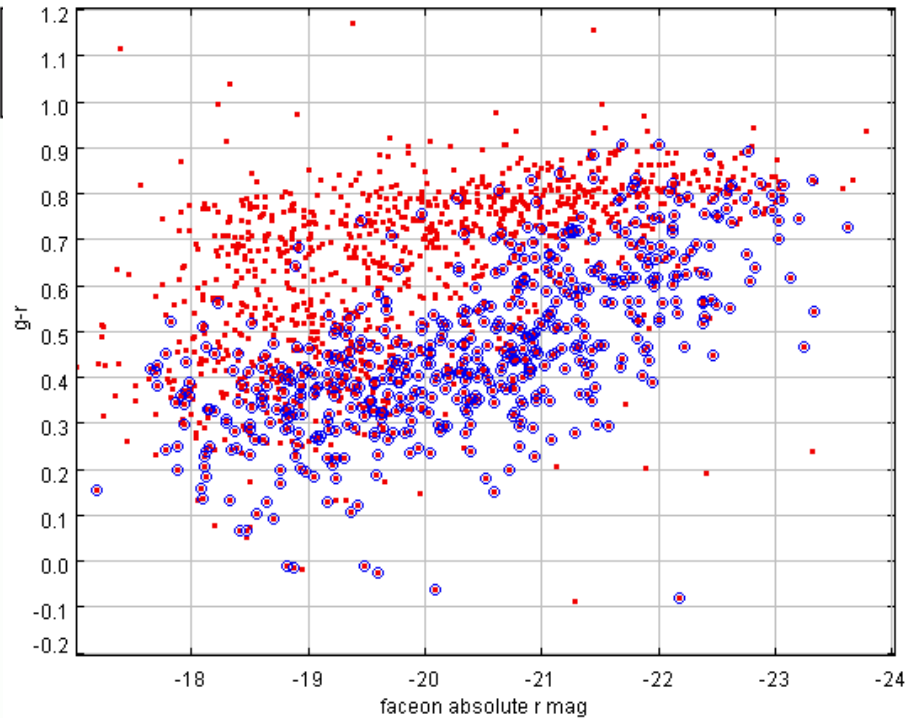


Result #0: HI sources are not as clustered as optical sources
HI sources tend to be in “blue cloud” not “red sequence”

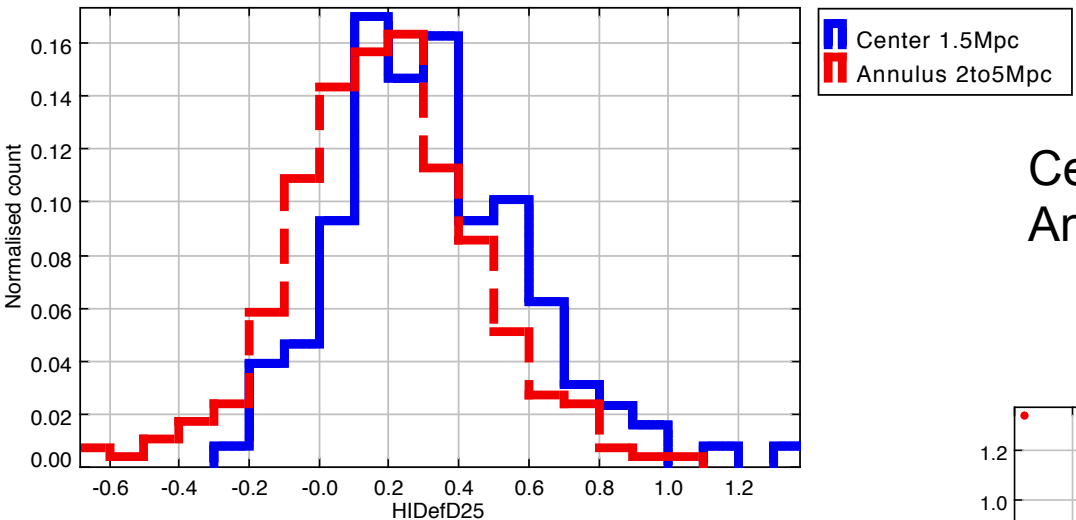
MKW11 optical and HI sources



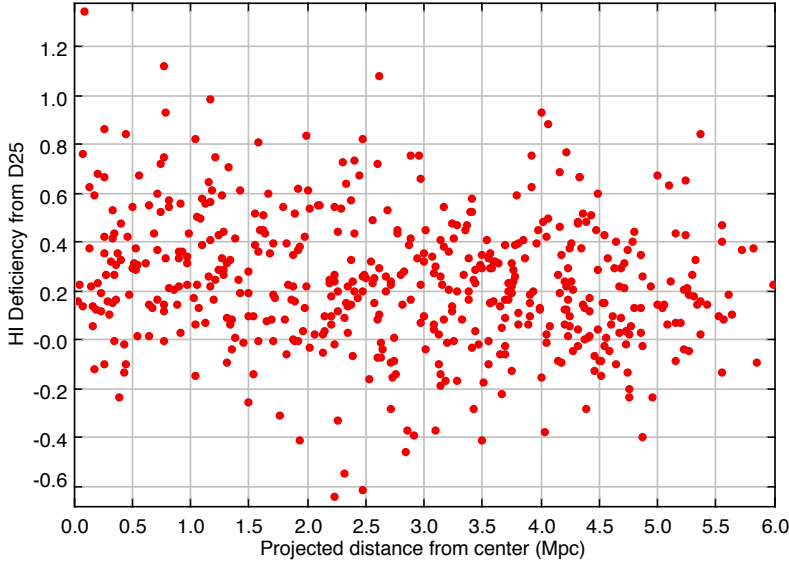
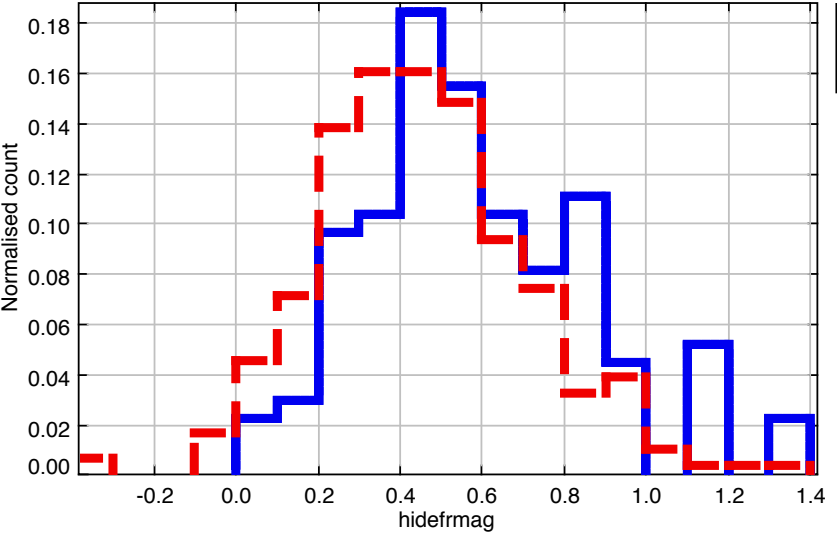
Galaxy color-magnitude diagram



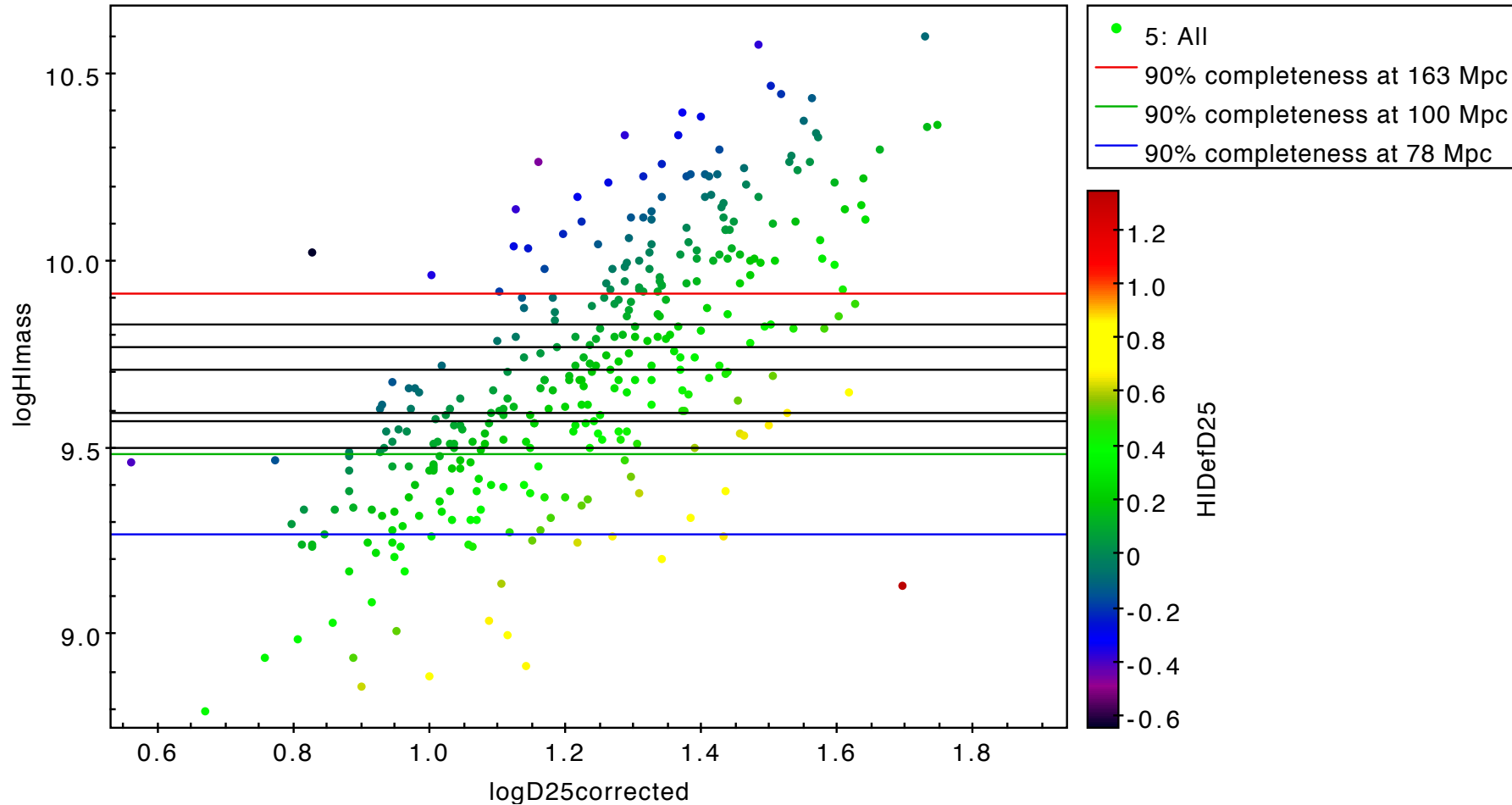
Result 1: Galaxies are more HI deficient in the centers of groups



Center: 0.322 ± 0.024
Annulus: 0.186 ± 0.016

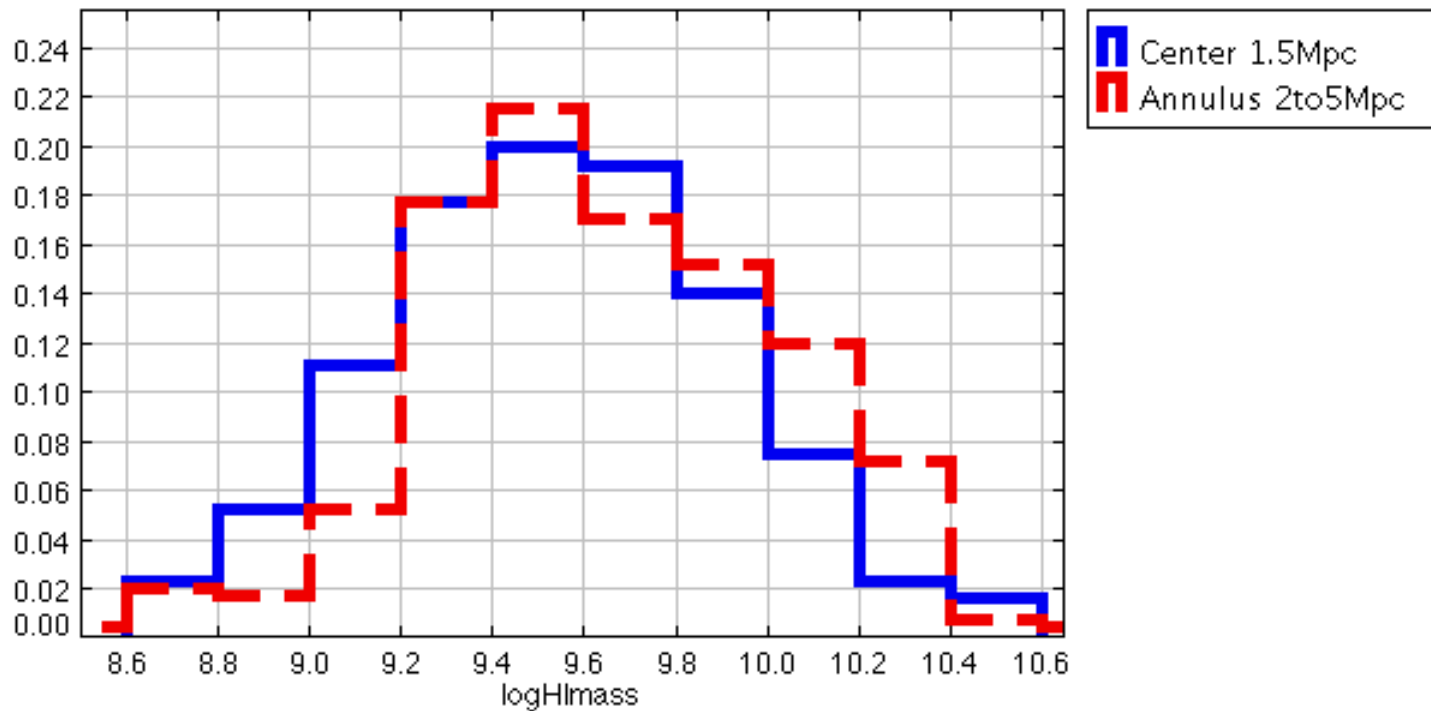


But there are lots of HI Deficient galaxies we're not detecting!



See Becky's talk for info on stacking non-detections to look more deeply...

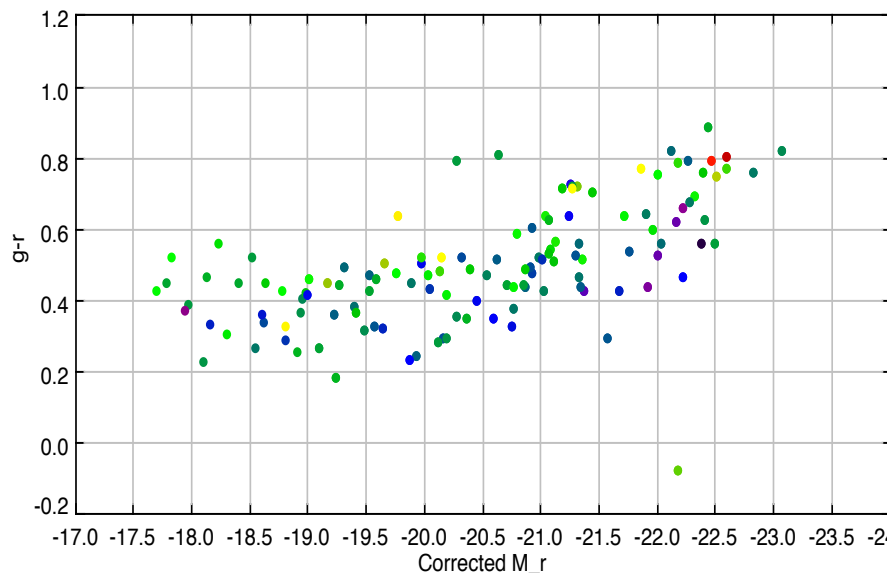
Result 2: The HI Mass function is different in the centers of groups



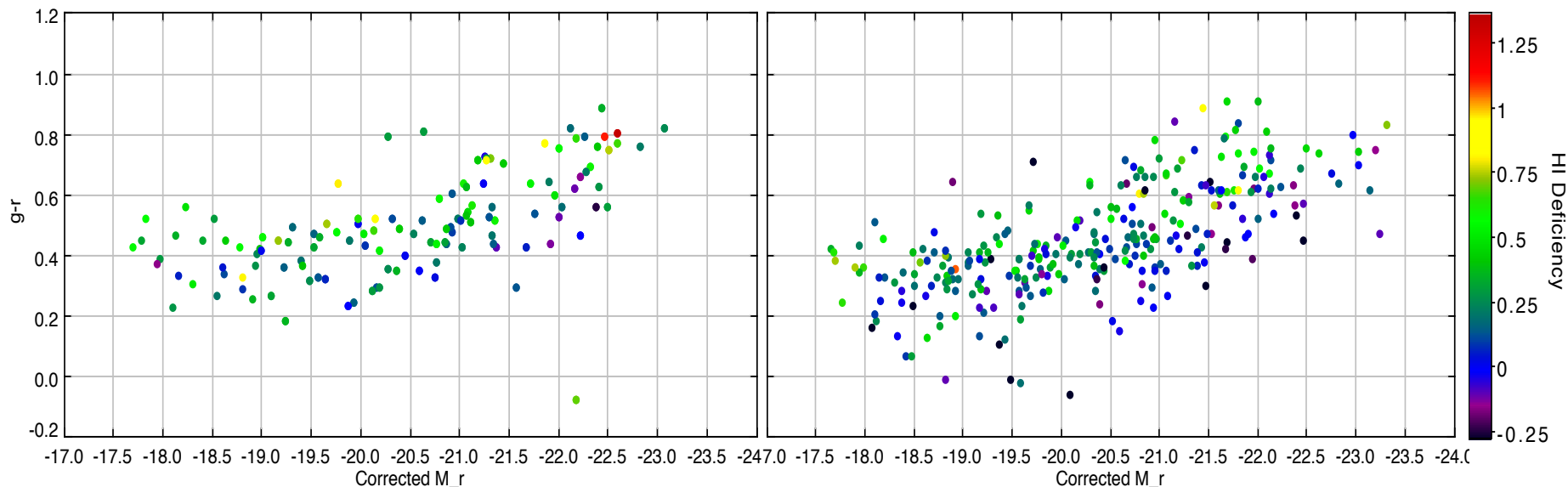
(Anna Egner '14 is working on this.)

Question: Is the difference in HI Deficiency explained by the difference in galaxy types in the center vs. the annulus? (Or do galaxies of the same type have different HI Deficiencies in different environments?)

Inner 1.5 Mpc



2-5 Mpc annulus



(Mark Raskin '16 is working on this.)

Next Steps

- Include data for NGC 5846 and A 2052
- Find a better way of summarizing the HI Deficiency of these galaxies...
E.g. the average for a range of HI mass where the sample is complete?
- Quantify gas missed in non-detections by stacking (Becky)
- Determine the types of the galaxies that are missing HI
- Finish calculating the HI mass function
- Possible comparison to Coma and Virgo regions

Longer term project: Try a different way of defining galaxy environment

Thanks!