

Summary of p_{bar} analysis for FERENGI

August 7, 2015

Here is a summary of the FERENGI analysis of p_{bar} . The main challenge p_{bar} has over $p_{features}$ is that not every user answers the bar question; therefore the usual cut on N_{bar} must be made in order to be confident in the corresponding p_{bar} value. The FERENGI data presents an additional challenge here, because we're analyzing *two* p_{bar} values per galaxy (one at high redshift and one at $z = 0.3$), so if we set a limit on N_{bar} , *both* images must meet that requirement to make it into the sample, hence limiting the number of analyzable galaxies even further.

I tested the FERENGI data in a few different ways: first, I examined the change in p_{bar} in the same ranges of redshift and surface brightness as we used for $p_{features}$. I did this with a minimum of 5 users to answer the bar fraction ($N_{bar} \geq 5$), 3 users, and no requirement. The plots are below. It is apparant that there is not enough data in any bin, regardless of the N_{bar} threshold, to make any conclusions about the change in p_{bar} with redshift. At best, we could correct 3000 galaxies in the Hubble sample, but I am skeptical on the reliability of even those corrections.

I also changed the binning on surface brightness to see if we could gain any more information by using larger bins. While we obtain more points/bin this way, the data within each bin still becomes too scattered to deduce any single-valued relationship out of it. For future work, if we want to debias questions further down the tree, more FERENGI data would be needed where we ensure enough users are answering these questions.

Graph Colors:

- **purple** = NEI (< 5 points / bin)
- **green** = uncorrectable (> 5 points/bin and spread is > bin height)
- **white** = correctable (> 5 points/bin and spread is < bin height)
- **orange** = spread of $p_{bar,z=0.3}$ distribution; represents the interquartile range

Table 1: Correctable Hubble galaxies for smaller SB bins

	$N_{bar} \geq 0$	$N_{bar} \geq 3$	$N_{bar} \geq 5$
correctable	2871	2642	1135
uncorrectable	2650	2602	500
NEI (not enough ferengi data)	101597	101874	105483
NEI (no redshift information)	10965	10965	10965

- 1 Smaller surface brightness bins (same as used for p_{features} analysis)

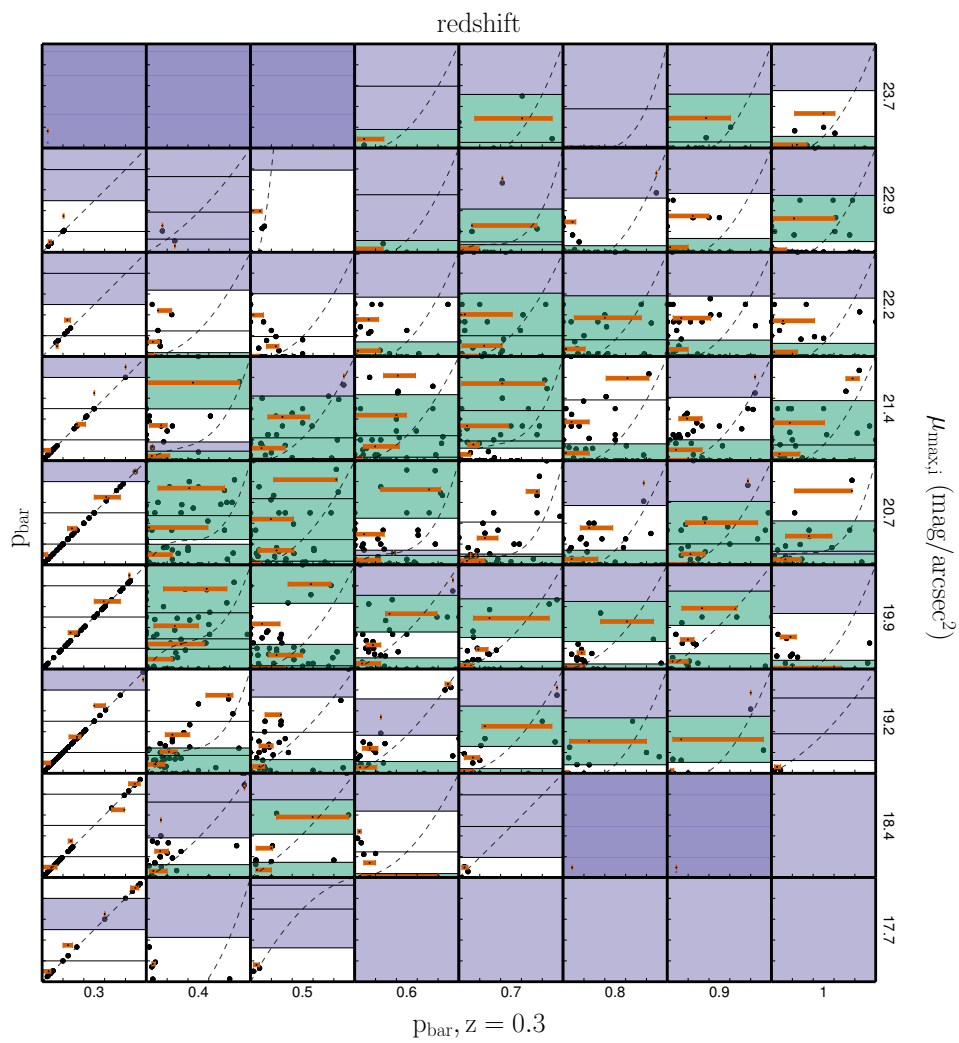


Figure 1: No requirement on N_{bar} .

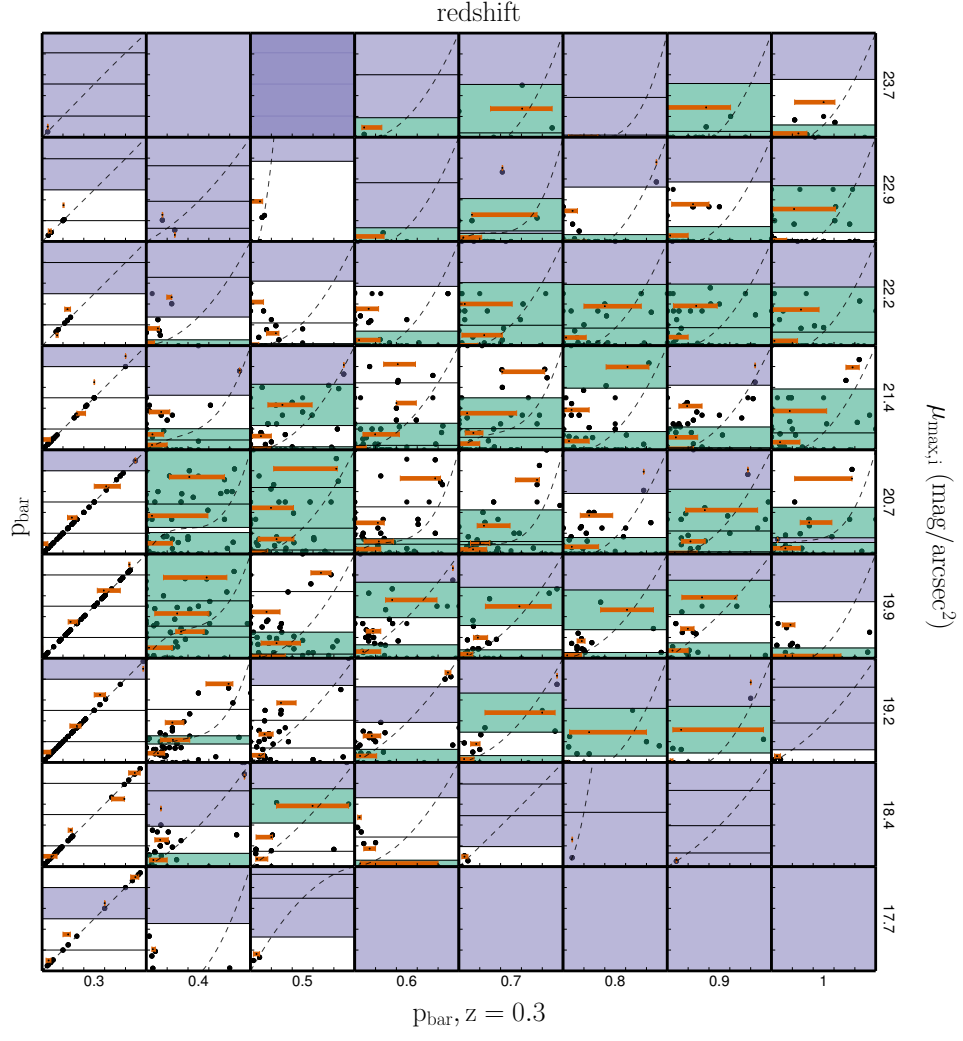


Figure 2: $N_{\text{bar}} \geq 3$

Table 2: Correctable Hubble galaxies for larger SB bins

	$N_{bar} \geq 0$	$N_{bar} \geq 3$	$N_{bar} \geq 5$
correctable	2997	2971	2673
uncorrectable	1967	2732	3192
NEI (not enough ferengi data)	102154	101415	101253
NEI (no redshift information)	10965	10965	10965

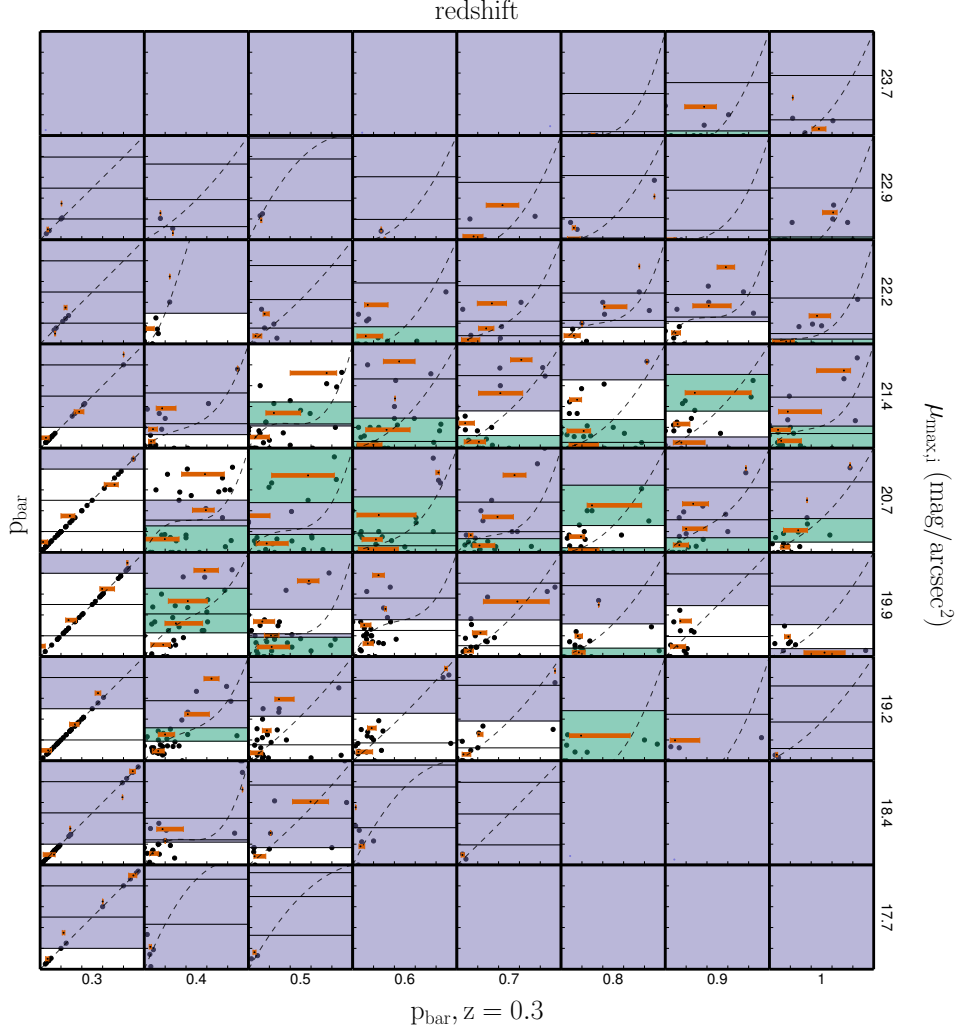


Figure 3: $N_{bar} \geq 5$

2 Larger surface brightness bins

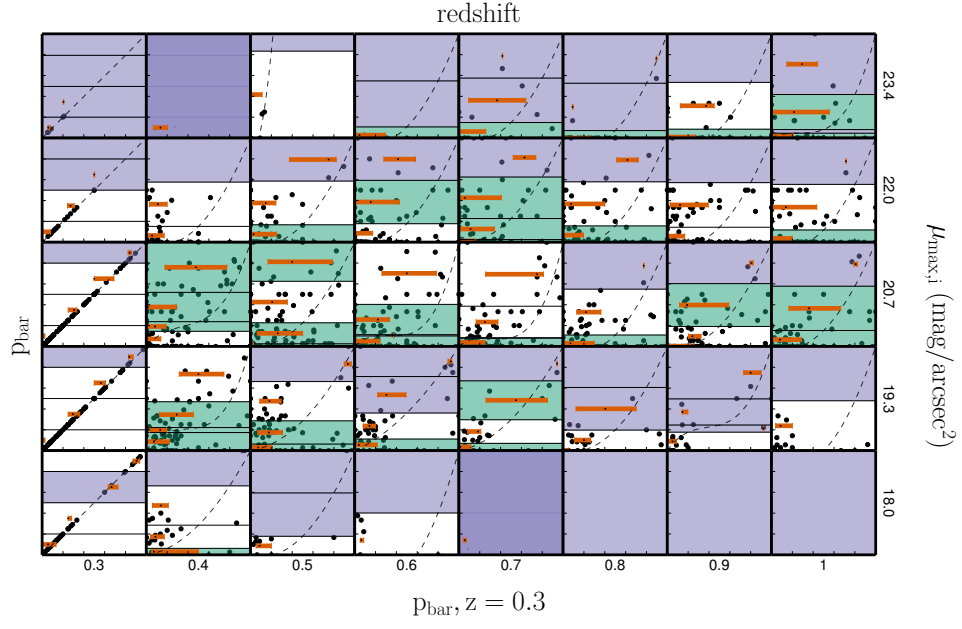


Figure 4: No requirement on N_{bar} .

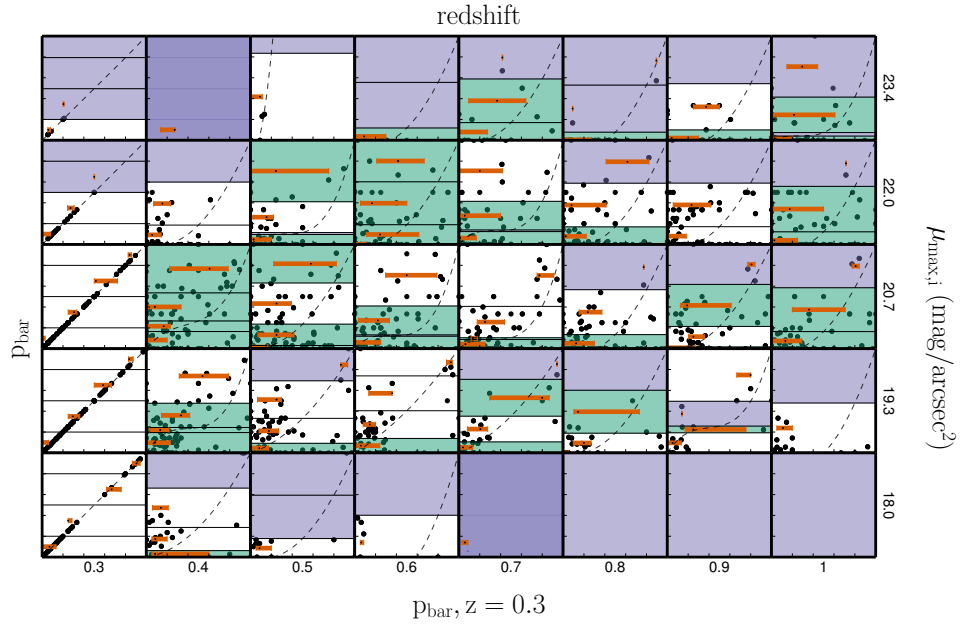


Figure 5: $N_{\text{bar}} \geq 3$

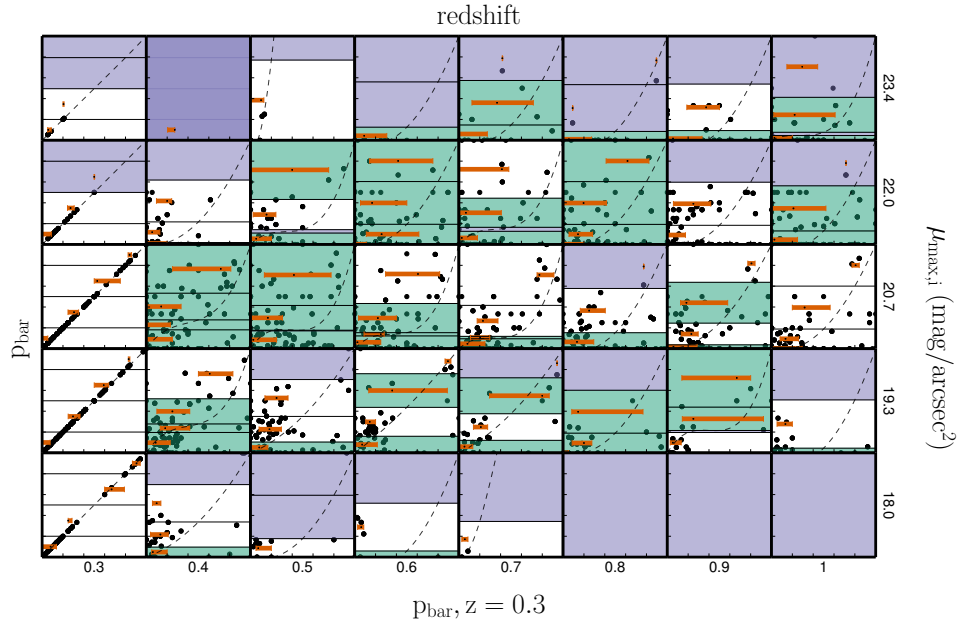


Figure 6: $N_{\text{bar}} \geq 5$