Maria Patterson

Astronomy 698: Project #3 (Monte Carlo Simulations)

Week 2: Malmquist Bias

Tables:

Below is a table of average values for several magnitude limit cuts.

Magnitude limit	All	16	14	12
Mean luminosity	-19.999166	-20.383352	-21.259441	-22.288260
Standard Dev	1.499926	1.243297	1.032343	1.104099
Average Distance	75.010368	73.417809	67.618973	54.455135
Number Visible	1,049,089	894,009	444,911	90,796

The same table after adding in some noise to absolute magnitudes.

Magnitude limit	All	16	14	12
Mean luminosity	-19.998449	-20.399086	-21.285568	-22.334808
Standard Dev	1.529408	1.263194	1.048123	1.106977
Average Distance	75.010368	73.399574	67.745522	55.153702
Number Visible	1,049,089	890,172	445,941	94,166

Retrieved least square fitting slopes and intercepts. Actual values: slope=-7.27, intercept=-20.

Magnitude limit	All	16	14	12
Slope	-7.274052	-7.271472	-7.270800	-7.271370
Y-intercept	-19.999670	-20.000240	-19.999746	-19.999540
Correlation Coefficient	0.992190	1.012067	0.994190	0.999575

Plots:

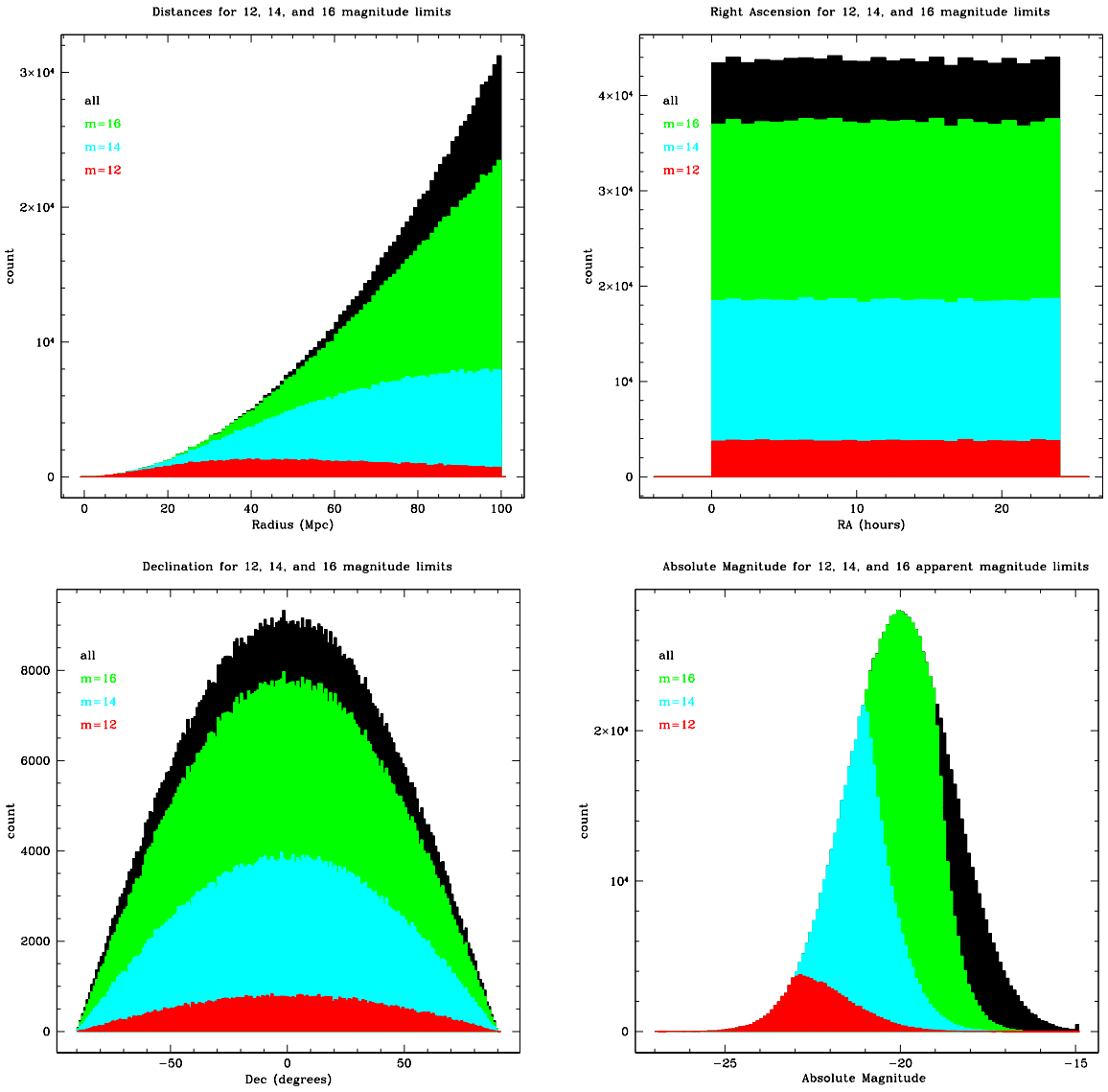

Figure 1: Magnitude cuts before addition of noise.

Plots:

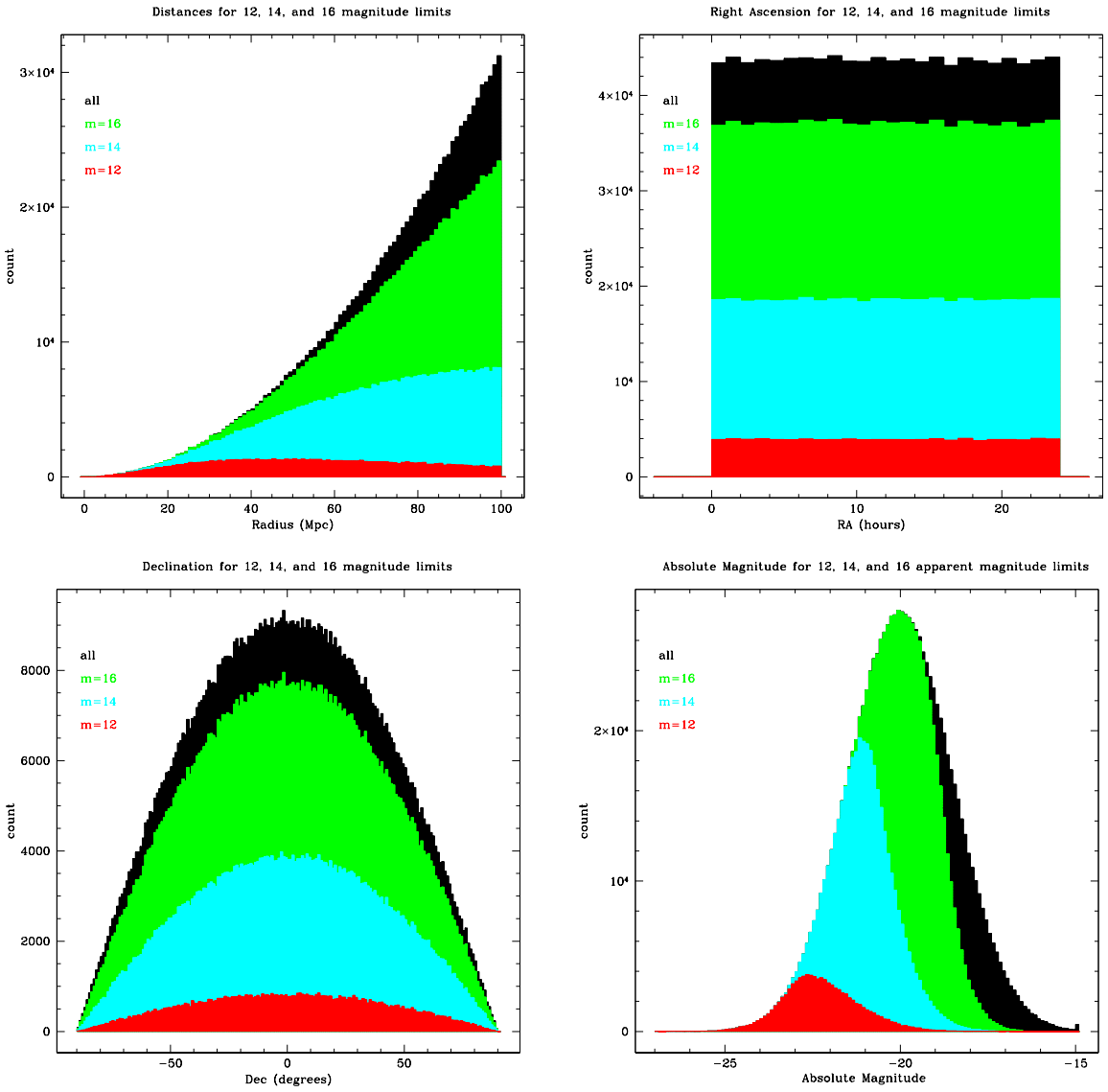

Figure 2: Magnitude cuts after addition of noise.