Parameter Space Results for LMC SNRs

Next few pages show parameter spaces for the 4 parameters in our model :-

- Fraction of Ia/CCs - f
- SN Rate (Ia + CC) - R
- Scale Height of HI disk - z_0
- Schmidt-Kennicutt Law Index - α

Parameters are constrained using 3 sets of observations :-

- Luminosity Distribution
- Diameter Distribution
- Ambient (Column) Density Distribution

The plots show confidence intervals calculated using log-likelihood described in my previous write-up (See Appendix A) for all SNRs brighter than L_{cut}.

Figs. 1-3 show the parameter space by luminosity, diameter and density comparison for $L_{cut} = 2 \times 10^{23}$ ergs/s/Hz.

Figs. 4-6 show the same for $L_{cut} = 9 \times 10^{22}$ ergs/s/Hz

Keep in mind the contours are **interpolated**: Due to runtime issues, I only sample (5×5) data points for each parameter pair, marginalize over the nuisance parameters and calculate the log-likelihood. The contours are then constructed by interpolating between these 25 log-likelihood values.

Luminosity Comparison ($L_{cut} = 2 \times 10^{23}\ ergs/s/Hz$)

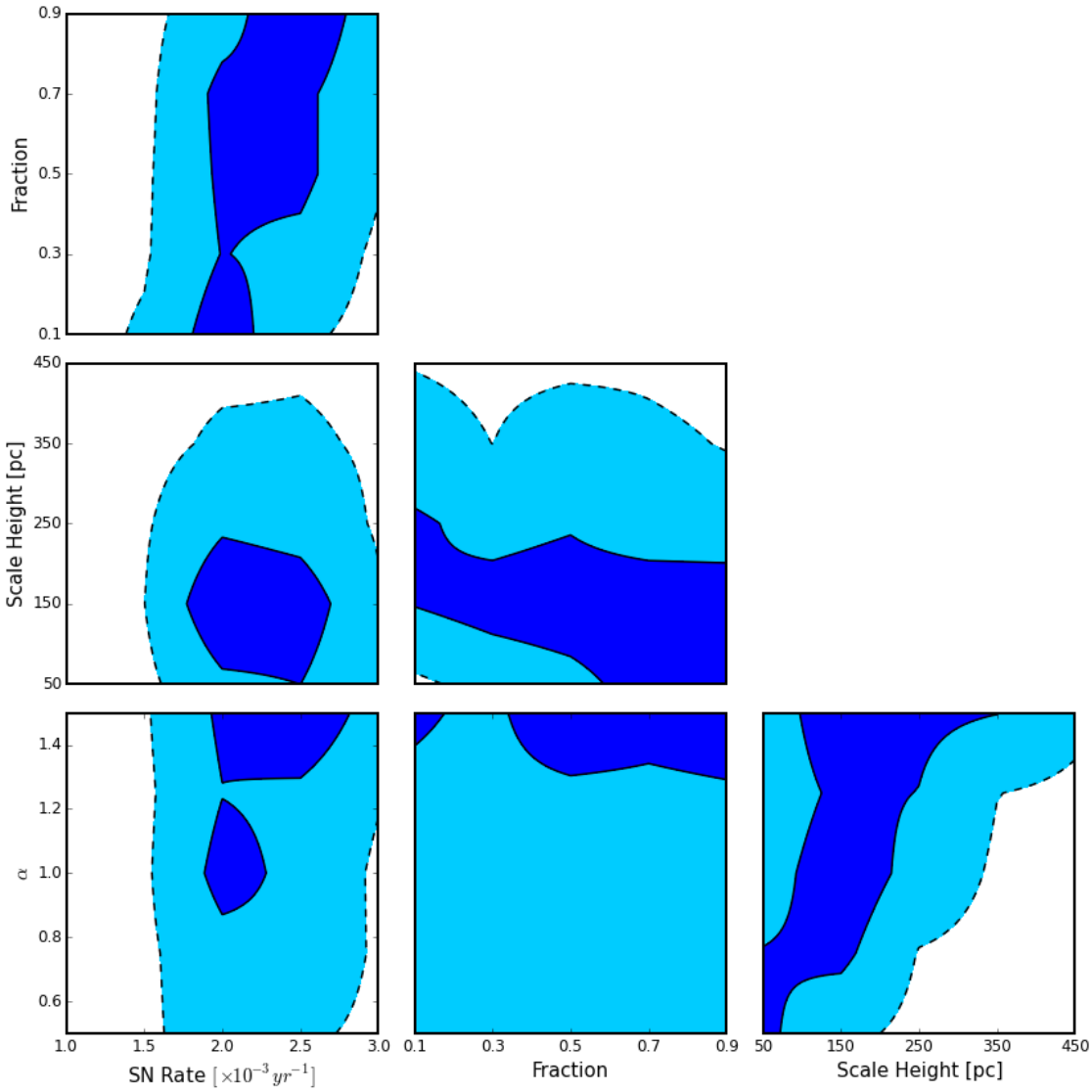

Figure 1: Parameter Space constructed from comparing observed vs. model luminosity distribution for all Supernova brighter than L_{cut}. 65% region is shown in blue with solid border. 95% region is shown in cyan with dashed border.

Diameter Comparison ($L_{cut} = 2 \times 10^{23}\ ergs/s/Hz$)

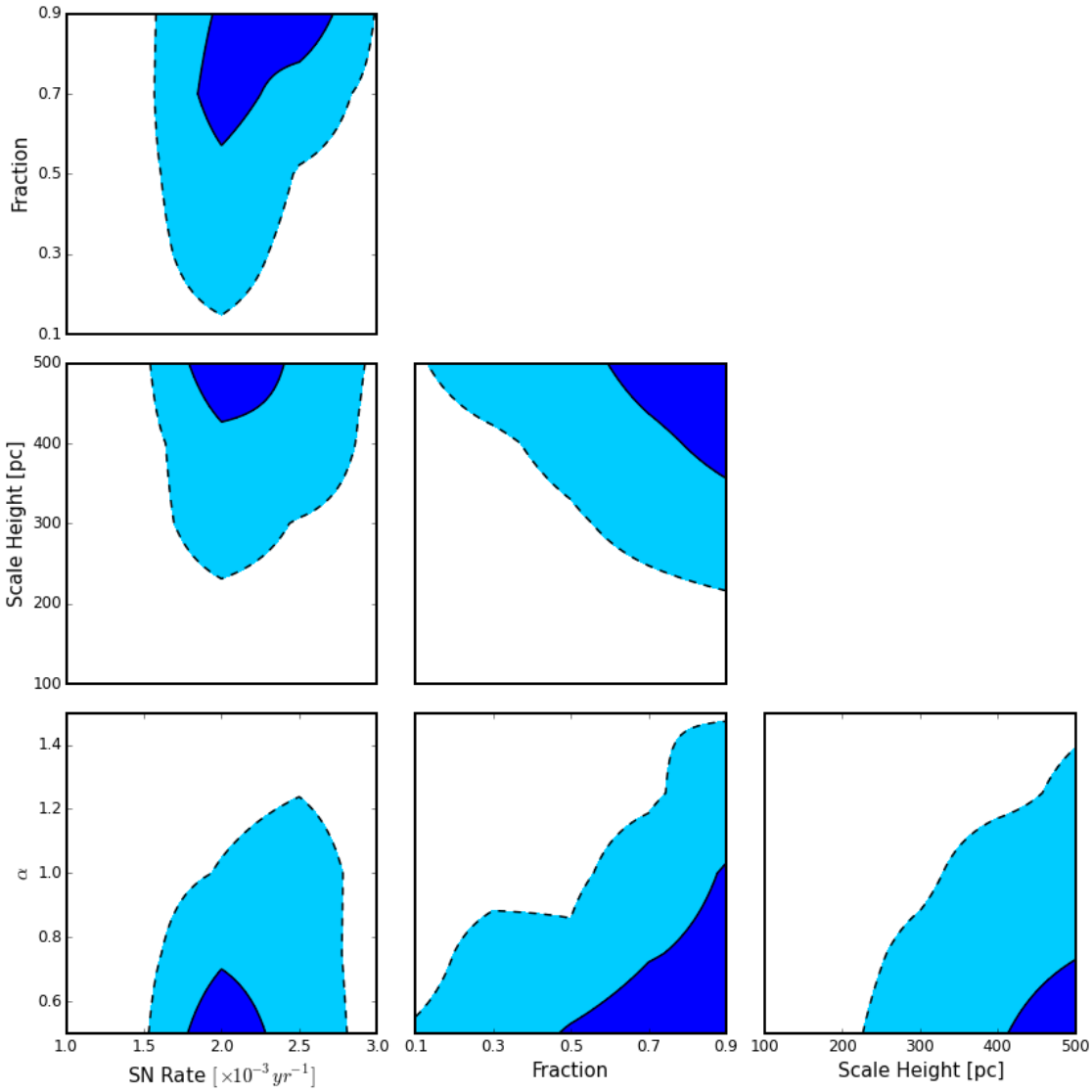

Figure 2

Diameter comparison sucks! I'll talk more about this.

Density Comparison ($L_{cut} = 2 \times 10^{23}\ ergs/s/Hz$)

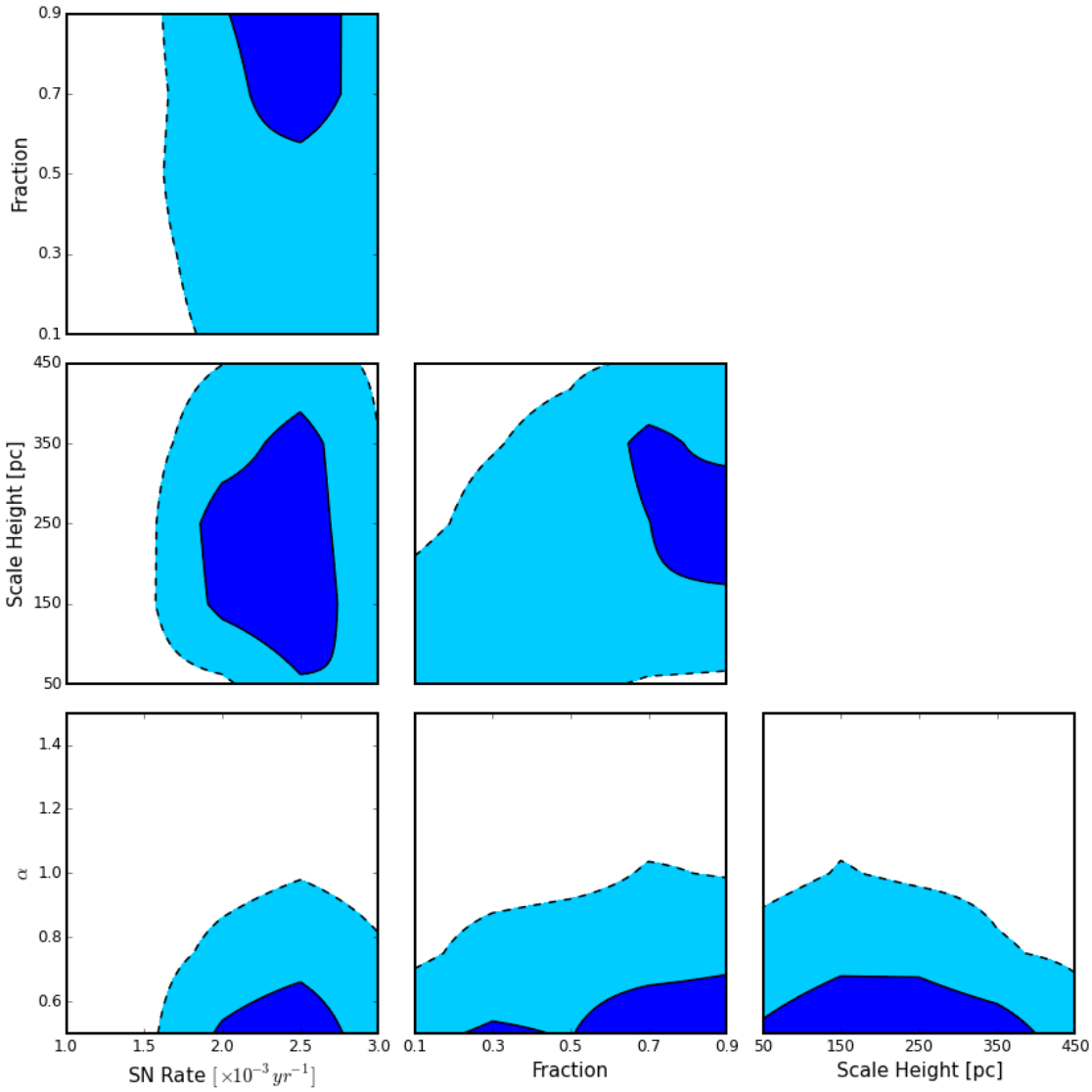

Figure 3

Luminosity Comparison ($L_{cut} = 9 \times 10^{22}\ ergs/s/Hz$)

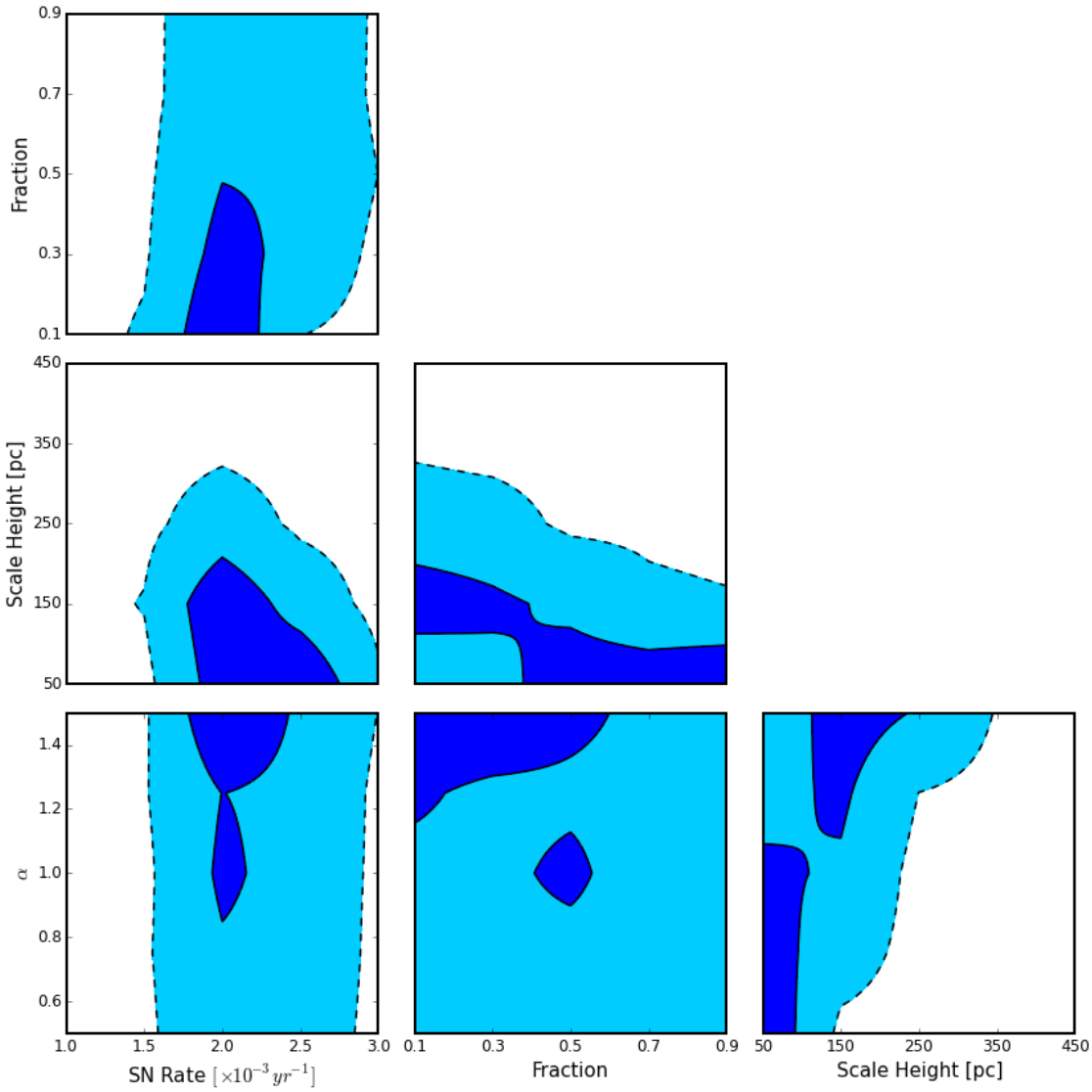

Figure 4: Parameter Space constructed from comparing observed vs. model luminosity distribution for all Supernova brighter than L_{cut}. 65% region is shown in blue with solid border. 95% region is shown in cyan with dashed border.

Diameter Comparison ($L_{cut} = 9 \times 10^{22}\ ergs/s/Hz$)

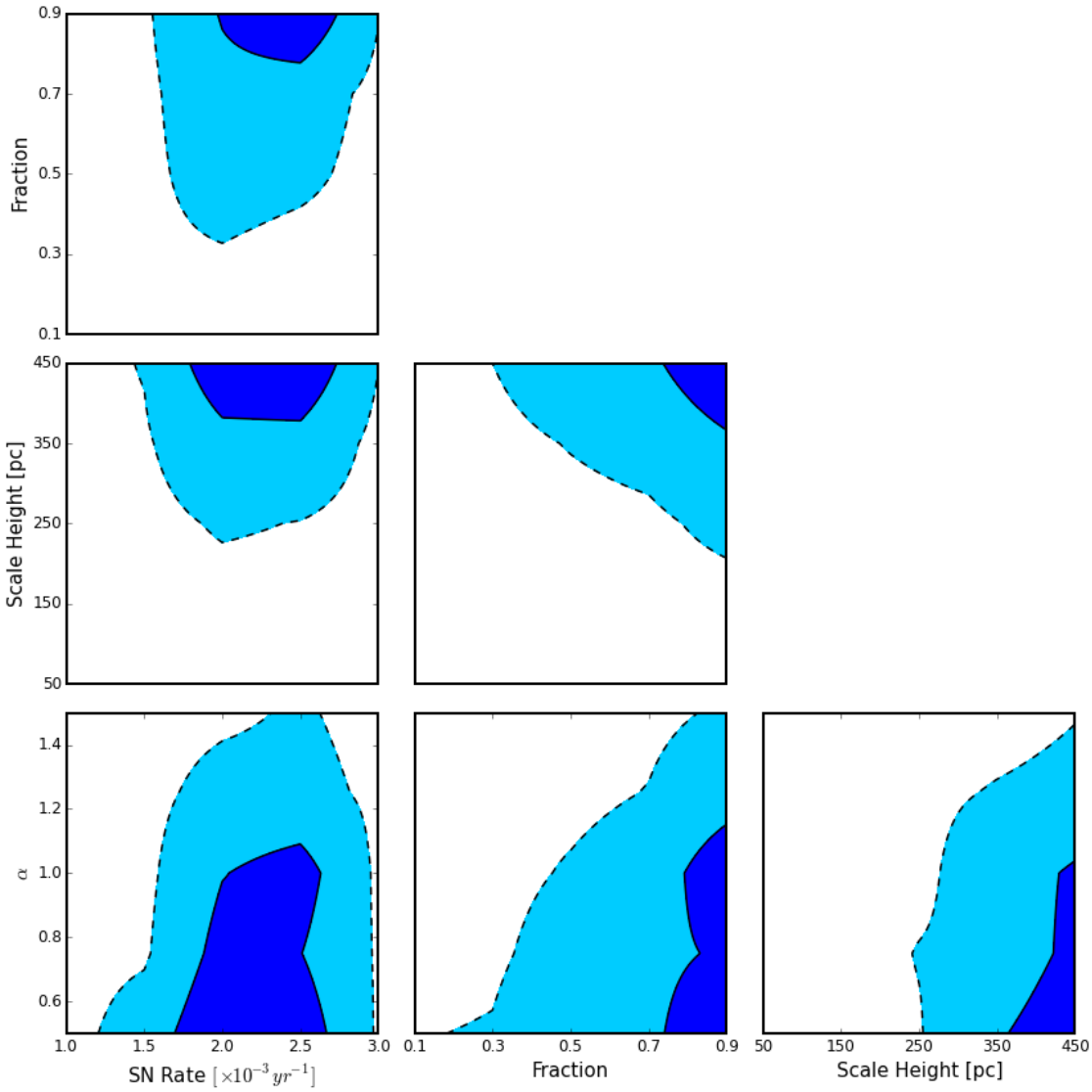

Figure 5

Density Comparison ($L_{cut} = 9 \times 10^{22}\ ergs/s/Hz$)

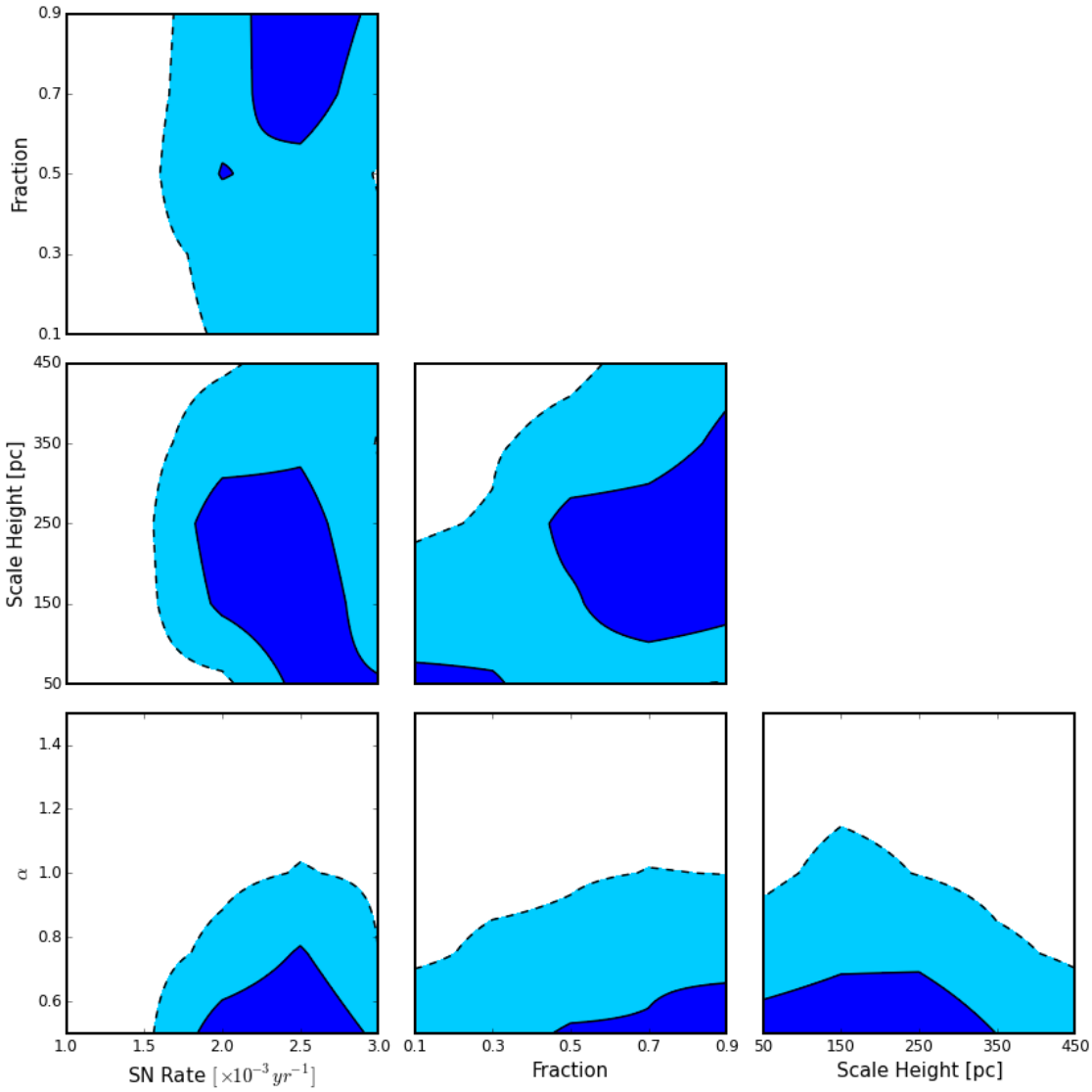

Figure 6