Astro 250: Stellar Populations
Problem Set 2 – IMF
Siyao Jia (Lucy)

Problem 1
In Wikipedia IMF term: For Miller-Scalo 1979, it says $\alpha \sim 0$ when $M < 1M_\odot$. But this is not correct, because in Miller&Scalo's paper, they claim $\Gamma \sim 0$ when $M < 1M_\odot$. From defination, we know:

$$\Gamma = \frac{\mathrm{d}F(logM)}{\mathrm{d}logM}$$

$$\gamma = \frac{\mathrm{d}f(M)}{\mathrm{d}M} = -\alpha \tag{1}$$

$$\frac{\mathrm{d}F(logM)}{\mathrm{d}logM} = \frac{\mathrm{d}f(M)}{\mathrm{d}M} + 1$$

From Equ(1), we can see that $\Gamma = \gamma + 1 = 1 - \alpha$, so $\Gamma \sim 0$ means $\alpha \sim 1$.