Ay190 – Worksheet 8

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Stellar Structure

(a) The core of this routine is a loop doing intergration from stellar center to an outer radius by a number of steps. For each step, we use the function "`tov_integrate_FE`" (the name would change for other mathods) to do the integration from i^{th} step to $(i+1)^{th}$ step.

(b) See my implementations in the code.

(c) I implement RK2, RK3 and RK4 method in the original code, please find them therein. In the next question, I will use RK4 run for the plot. Note that to avoid data outflow, I choose a small value 1×10^{-8} instead of 0 for a start.

(d) I plot the density $\rho(r)$ and accumulated mass $M(r)$ against radius r in Figure 1. I omit the pressure since it is simply related to density.

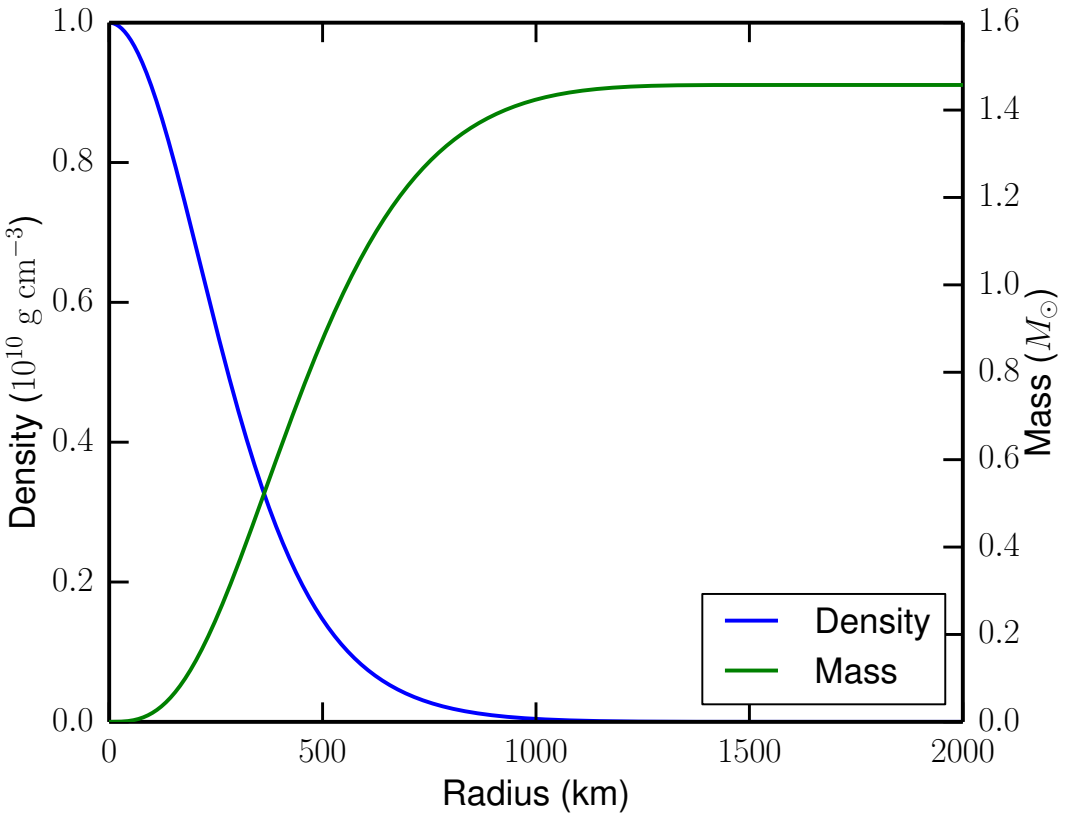

Figure 1: Stellar Structure