Problemas Unidad 2

Elegir seis de la siguiente lista:

Pols → 3.1, 3.4, 5.2
Lamers → 5.2

If a star possesses a specific intensity of the form $I_v (z , u) = a_v (z) + b_v (z) u$, where the functions $a_v(z)$ and $b_v(z)$ are independent of u , calculate $F_v (z)$.

Find the pressure stratification $P(r)$ inside a star with mass M$_*$ and radius R$_*$ in which the density decreases linearly with r via the expression.

$$\rho(r) = \rho_c \left(1 - \frac{r}{R_*} \right)$$

where ρ_c is the central density.

Estimate the gas pressure, the radiation pressure, and the total pressure in a typical main sequence star with O3 spectral type. Which term dominates the total pressure?

What is the value of the maximum photoionization cross section of the hydrogen atom for transitions from the ground state?

Show that the boundary between the pure scattering region and the region where bound–free transitions dominate occurs for

$$\rho \simeq 4.7 \times 10^{-27} \frac{t}{g_{bf} Z} T^{3.5} \text{ g/cm}^3 .$$