421 note

$\rho = t$, $\frac{d\rho}{dt} = 1$

$\rho = \frac{4}{3}\pi r^3$

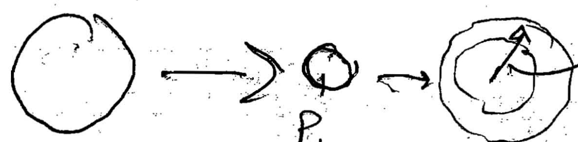
$\frac{d\rho}{dr} = \frac{4}{3}\pi \cdot \frac{3}{3} r^2 \sim r^2$

Confinement

Types { Spherical symmetry

$n = \frac{4}{3}\pi r^3$

ICF



P_b

$v_s \sqrt{\frac{\gamma 2 n_i kT}{n_i m_i}}$ $\sqrt{\frac{\gamma p}{nm}}$

ignore P_B etc

$\sim \sqrt{\frac{10}{3}\frac{kT}{m}}$

$$\tau \sim \frac{2R_b - R_b}{v_s} \sim \frac{R_b}{v_s} \sim R_b\left(\frac{3m}{10kT}\right)^{1/2}$$

conf parameter: $n\tau \rightarrow \rho R_b$

$m n \tau = m\, 10^{14}$

$\rho \tau = $

$\rho R_b = \left(\frac{10kT}{3m}\right)^{1/2} m\, 10^{14}$

$\sim 3\, gm/cm^2$

$\tau_b \sim \tau$

$$\frac{dn}{dt} = -n_1 n_2 \langle \sigma v \rangle \qquad n = n_1 + n_2$$

DT

$$= -\frac{n^2}{4}\langle \sigma v \rangle$$

DT $n_D \sim n/2$

$n_T = n_2$

$n = n/2 + n/2$ ✓

$$\equiv -\frac{n}{\tau}$$

$\rho R \sim 3\, gm/cm^2$

$10^3 R$

$R \sim \frac{3}{10^3}$ cm

$\sim 3\times10^{-3}$

$\sim 30\mu m$

$$\tau = \frac{4}{\langle \sigma v \rangle n}$$

$\boxed{\text{main issue R-T}}$

$$\therefore n\tau_b = \frac{4}{\langle \sigma v \rangle} = n_b R_b \left(\frac{3m}{10kT}\right)^{1/2}$$

$E \sim 20\, keV$ $\quad nR > 10^{24}\, cm^{-2}$

$$f_b = \frac{-n_T + \# \text{ burned}}{n_T} = \frac{{}^{DT}n - \frac{n^2}{4}\langle \sigma v \rangle \tau}{n}$$

$$= \frac{n}{2}\langle \sigma v \rangle \tau \leftarrow R_b\left(\frac{3m}{10kT}\right)^{1/2}$$

$$\frac{4}{\langle \sigma v \rangle n}$$

$$= \frac{-n_T + n_B}{n_T}$$

?

$$= -1 + \frac{n_B}{n_T} = 1 - \cancel{2 \; 2}$$

$$= 2 - 1 = 1$$

100%!