

Pulsed device  
 $\approx \text{pinch} = \text{GTL} \text{ or web}$

$T_s = T_e = T$

$n_i = n_e = n$

$p_{bl} = 2n kT$

421  
 notes

Magnetic

$\frac{2}{3} n \bar{E}$

$p_{PL} \sim n_i kT_i + n_e kT_e$

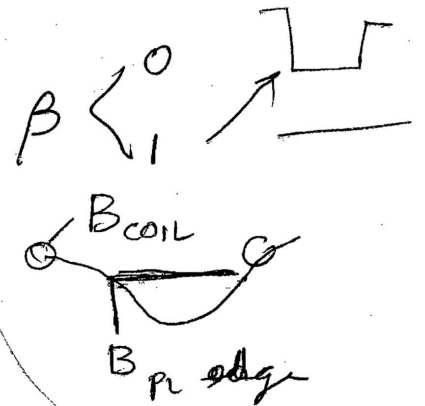
$\frac{1}{2} T = \frac{2}{3} \bar{E}$

$p_m \sim \frac{B^2}{2\mu}$  — permeability  $\mu_0$   
 (vs permaturity)

$\beta = \frac{p_{PL}}{p_B}$

$\beta p_B \sim \mu n kT + n kT$

$\beta \frac{B^2}{2\mu} \sim 2n kT$

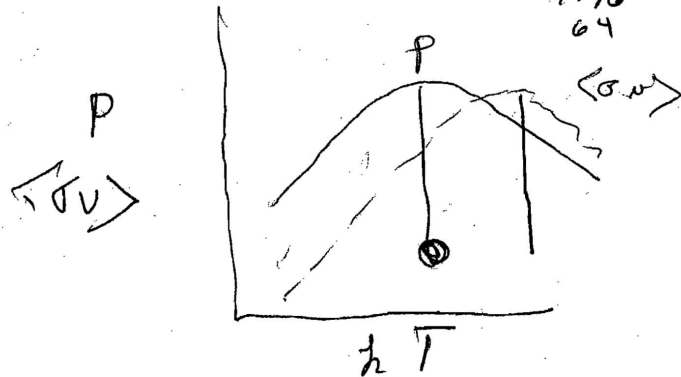


$n \sim 2 \times 10^{18}$   
 $kT \sim 100 \text{ eV}$   
 $p_i \sim 1.6 \times 10^8 \text{ dyn/cm}^2$   
 $\frac{\beta}{2\mu} = \dots$   
 $B \sim 0.3 \times 10^4$   
 $= 63 \text{ kG}$   
 $= 6.3 \text{ Tesla}$

assume SS -

DT

$P \sim \frac{1}{4} n^2 \langle \sigma v \rangle = \frac{1}{4} \frac{\beta B_n^2}{\mu} \langle \sigma v \rangle$



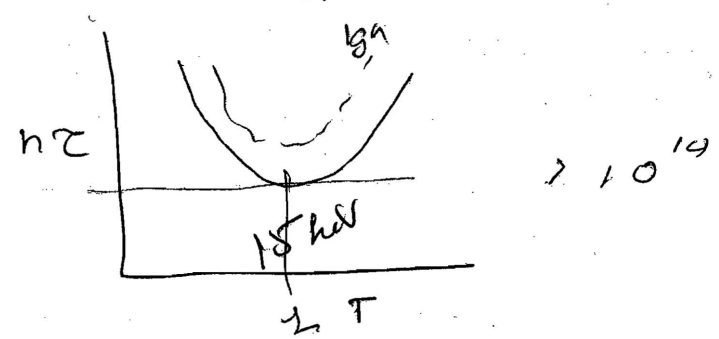
OPT. kT

heat to  $2T$   $kT = \frac{2}{3} E$   
 $E_b = E_m = \frac{3}{2} (n kT) + \frac{3}{2} n kT$   $E = \frac{3}{2} n kT$   
 $= 3 n kT$

$\frac{n^2}{4} \langle \sigma v \rangle \tau_b Q_f$

$n \tau_b = \frac{3 kT}{\frac{1}{4} \langle \sigma v \rangle Q_f}$

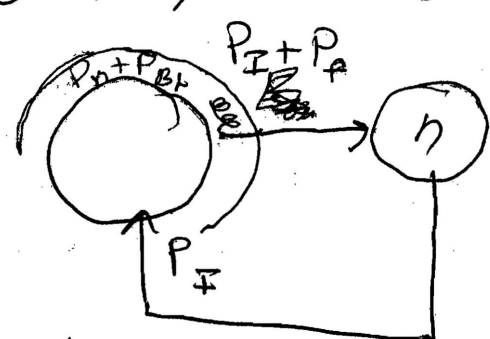
Ideal gas mixture  
 $P \propto E_b = E$



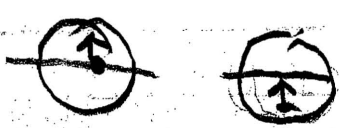
Losses added

- ①  $P_{Br}$  loss
- ② Recycle at  $1/3$

repeat for  
 $D-3He$   
 $2$  neutrons  
 $He-3 + p$   
 $< \gamma$   
 direct



Other - Tokamak  
 Stellarator  
 Bumpy torus



Tom STIX

