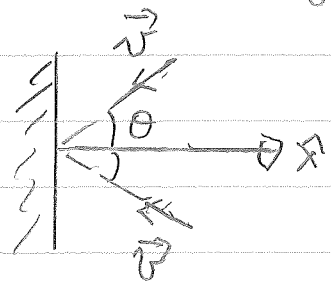
Radiation pressure

"derivation" like for monatomic ideal gas



$|\vec{v}| = c$

$p = hf/c$

$\Delta p_x = 2p_x$

$\Delta x = v_x \Delta t$

$$f_x = \frac{\Delta p_x}{\Delta t} = \frac{2p_x v_x}{\Delta x}$$

$$F = \left[\left(\frac{N}{V}\right) A \Delta x\right]\left(\frac{1}{2}\right)\left(\frac{2p_x v_x}{\Delta x}\right)$$

$\frac{1}{2}$ move towards wall on average

$$\langle p_x v_x \rangle = \frac{1}{3} pc = \frac{1}{3} hf$$

$$\boxed{p = \frac{F}{A} = \left(\frac{N}{V}\right)\frac{1}{3} hf}$$