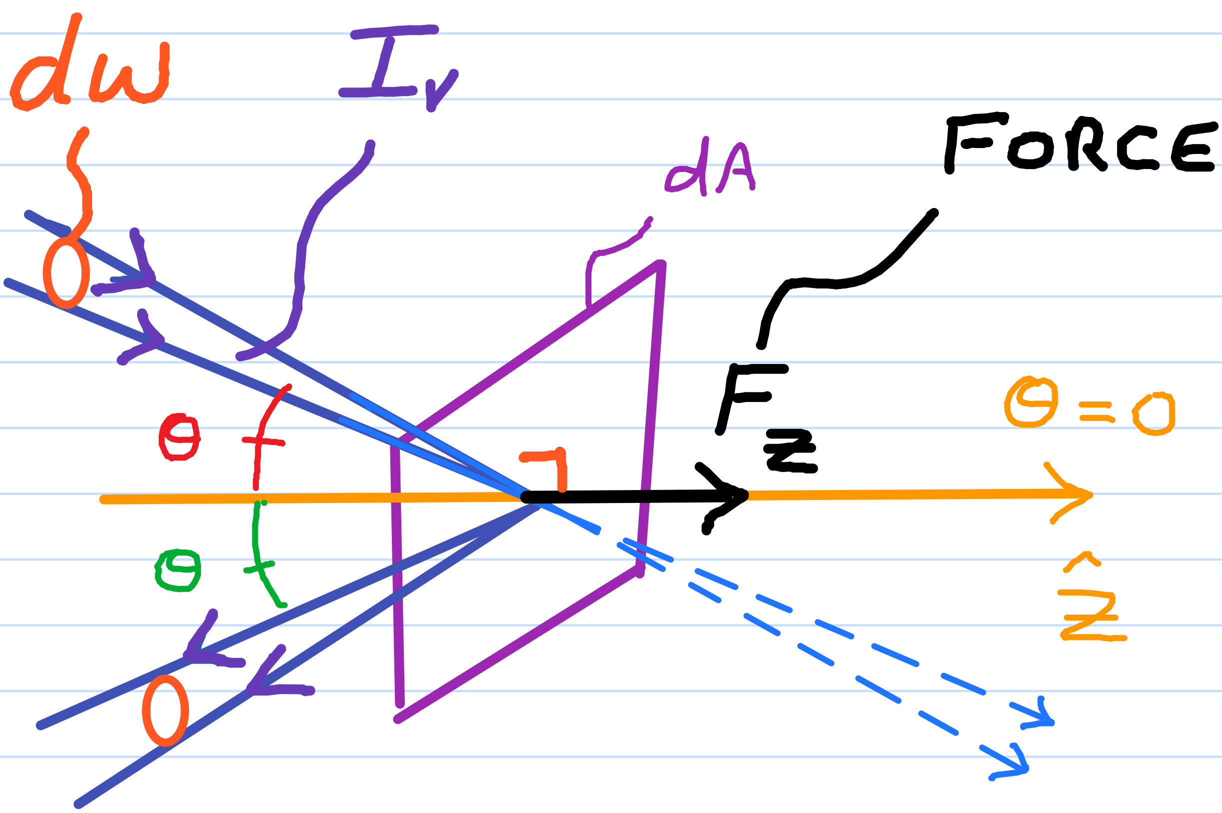
MONOCHROMATIC RADIATION PRESSURE,

$P_\nu(\vec{r}, \nu, t)$ (dyne/cm²/Hz)

(PHOTON "GAS" MODEL)



$$P_\nu \, d\nu \, d\omega \equiv \frac{dF_z}{dA}$$

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$$dF_z = \frac{dp_\nu \cos\theta}{dt}$$

(p = MOMENTUM)

PHOTONS: $dp_\nu = \frac{\underline{dE_\nu}}{c}$

$$\therefore \quad P_\nu \, d\nu \, d\omega = \frac{1}{c} \frac{\underline{dE_\nu} \cos\theta}{dt \, dA}$$

RECALL: $dE_\nu \equiv \underline{I_\nu} \cos\theta \, dA \, dt \, d\omega \, d\nu$

$$P_\nu \, d\omega = \frac{1}{c} I_\nu \cos^2\theta \, d\omega$$

$$P_\nu(\vec{r}) = \frac{1}{c}\oint_0^{4\pi} I_\nu(\vec{r},\vec{l})\cos^2\theta \, d\omega$$

1D AXI-SYMMETRIC MODEL:

$$I_\nu(\vec{r},\theta,\phi) = I_\nu(z,\mu):$$

$$P_\nu(z) = \frac{2\pi}{c}\int_{\mu=-1}^{1} \mu^2 I_\nu(z,\mu)\,d\mu$$

BOLOMETRIC RAD. PRESSURE

P_{RAD} (dyne/cm^2)

$$P_{RAD}(z) \equiv P(z) = \int_0^\infty P_\nu(z)\,d\nu$$

ANGLE-MOMENTS OF $I_\nu(z,\mu)$ IN 1D AXI-SYMMETRIC MODEL

n^{th} ANGLE-MOMENT $\equiv \frac{1}{2}\int_{-1}^{1} \mu^n I_\nu \, d\mu$

$n = 0$: "ZEROTH MOMENT"

$$\mu^0 = 1$$

$$\frac{1}{2}\int_{-1}^{1} I_\nu(z,\mu)\, d\mu \equiv \underline{J_\nu(z)}$$

$n = 1$: "FIRST MOMENT"

$$\frac{1}{2}\int_{-1}^{1} \mu \, I_\nu(z,\mu) \equiv \underline{H_\nu(z)}$$

EDDINGTON FLUX, $H_\nu \equiv \frac{F_\nu}{4\pi}$

$n = 2$: "SECOND MOMENT"

$$\frac{1}{2}\int_{-1}^{1}\mu^2 I_\nu(z,\mu) \equiv K_\nu(z)$$

- THE "K INTEGRAL"

$$K_\nu \equiv \frac{c}{4\pi} P_\nu$$

BOLOMETRIC:

I, J, H, K