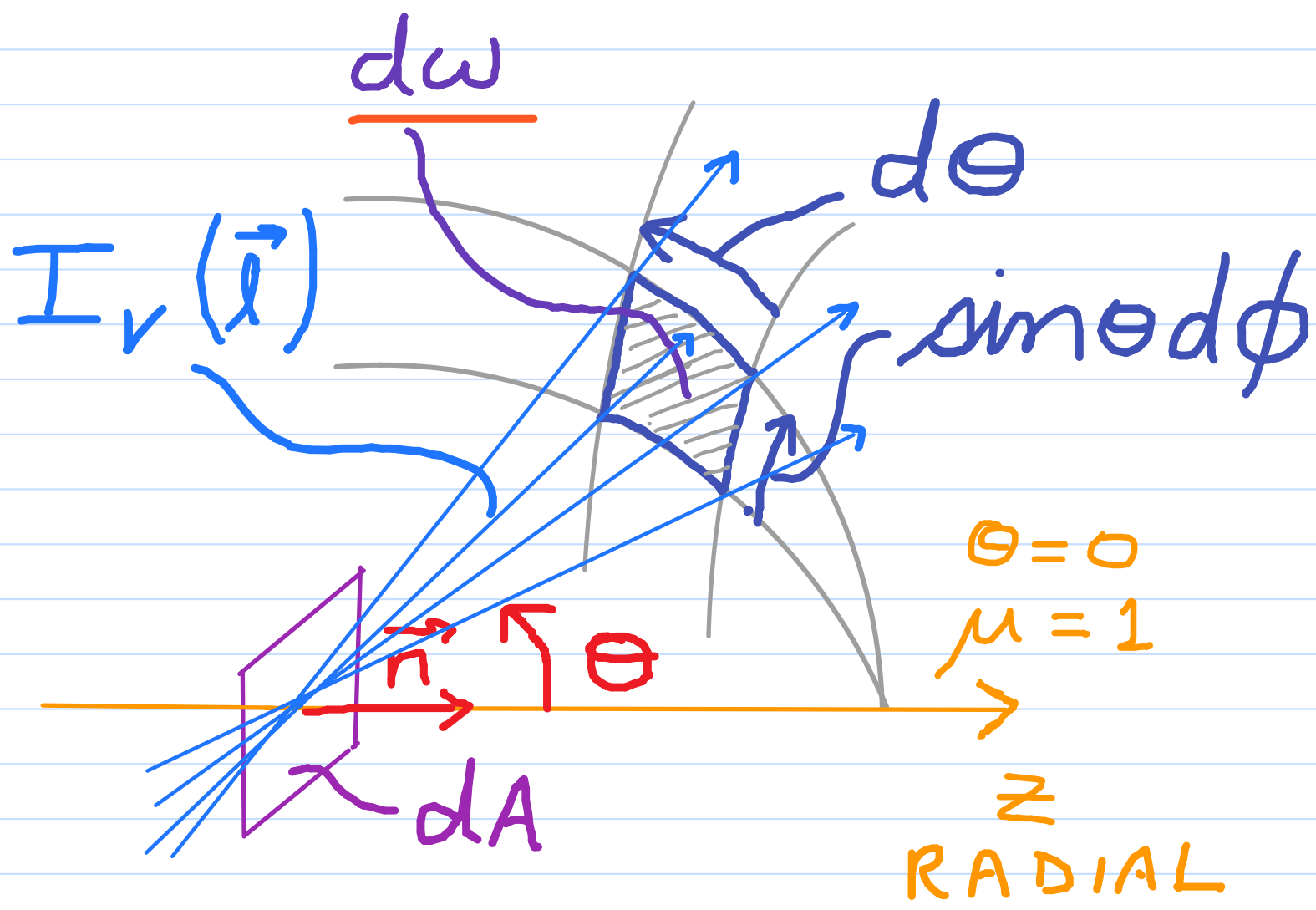


MONOCHROMATIC MEAN INTENSITY,
 $I_\nu(\vec{r}, t, \nu)$ (erg/s/cm²/STER/Hz)

- ANGLE-AVERAGE OF $I_\nu(\vec{r})$



$dw = \sin\theta d\theta d\phi$

$$J_{\nu}(\vec{r}) \equiv \frac{\int_0^{4\pi} I_{\nu}(\vec{r}, \vec{l}) d\omega}{\int_0^{4\pi} d\omega}$$

$$= \frac{1}{4\pi} \int_0^{4\pi} I_{\nu}(\vec{r}, \vec{l}) d\omega$$

$$J_{\nu}(\vec{r}) = \frac{1}{4\pi} \int_{\phi=0}^{2\pi} \int_{\theta=0}^{\pi} I_{\nu}(\vec{r}, \theta, \phi) \sin\theta d\theta d\phi$$

STER

$$(\text{erg/s/cm}^2 / \text{STER/Hz})$$

- SAME AS I_{ν}

1D AXI-SYMMETRIC MODEL:

$$I_v(\vec{r}, \theta, \phi) = I_v(\underline{z}, \theta) :$$

$$J_v(\underline{z}) = \frac{2\pi}{4\pi} \int_{\theta=0}^{\pi} I_v(\underline{z}, \theta) \sin\theta d\theta$$

$$= \frac{1}{2} \int_{\theta=0}^{\pi} I_v(\underline{z}, \theta) \sin\theta d\theta$$

$$\mu \equiv \cos \Theta \rightarrow d\mu = -\sin \Theta d\Theta$$

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

$$= \frac{1}{2} \int_{\underline{\mu}=-1}^{\mu=1} I_\nu(\underline{z}, \mu) d\mu > 0$$

SIGNIFICANCE:

$4\pi J_\nu(\underline{z}) = \text{TOTAL MONOCHROM. POWER FROM ALL DIRECTIONS}$

- eg. PHOTO-IONIZATION RATE

MONOCHROMATIC ENERGY DENSITY,

$$\underline{\mu}_\nu(\vec{r}, t, \nu) \quad (\text{erg/cm}^3/\text{Hz})$$

1D MODEL:

$$\underline{\mu}_\nu(\underline{z}) = \frac{4\pi}{c} \underline{J}_\nu(\underline{z})$$

BOLOMETRIC QUANTITIES:

$$J(\underline{z}) = \int_{\nu=0}^{\infty} J_\nu(\underline{z}) d\nu$$

$$(\text{erg/s/cm}^2/\text{STER})$$

$$\mu(\underline{z}) = \frac{4\pi}{c} J(\underline{z})$$

$$(\text{erg/cm}^3)$$