

[Min41] MINNAERT M.: The reciprocity principle in lunar photometry. *Astrophysical Journal*, 3 (1941), 403– 410. 10

$\omega_o$ : This is the outgoing (view) direction vector (often normalized).  $\cos \omega_i$  and  $\cos \omega_o$ : These are actually shorthand notations.

They don't mean the cosine of the entire vector, but rather:  $\cos \omega_i$  actually means  $\cos(\theta_i) = (\omega_i, n)$   $\cos \omega_o$  actually means  $\cos(\theta_o) = (\omega_o, n)$

Where:

$\theta_i$  is the angle between  $\omega_i$  and the surface normal  $n$ .

$\theta_o$  is the angle between  $\omega_o$  and the surface normal  $n$ .

$$\rho_d = 0.3, 0.05, 0.05 \tag{1}$$

$$k = 0.5 \tag{2}$$

$$f = \frac{\rho_d}{\pi} * ((\vec{n} \cdot \vec{\omega}_i) * (\vec{n} \cdot \vec{\omega}_o))^{(k-1)} \tag{3}$$