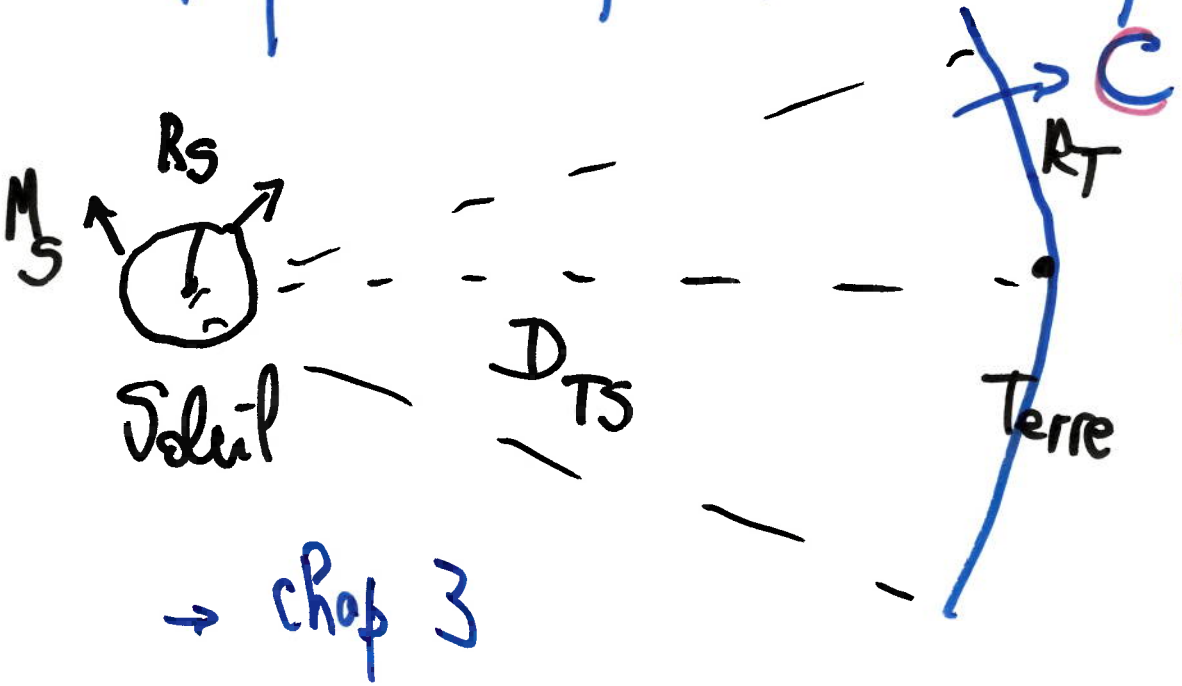
① ⓐ Source d'énergie de la Terre = Soleil

Transport par { Rayt
Conduction
Convection } Non car vide

→ Terminologie
chap 1

ⓑ Caractériser la source solaire

→ Rayt du corps Noir = chap 2 → Stefan
→ Wien



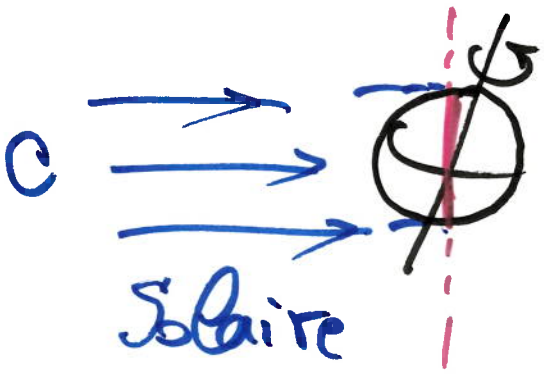
→ chap 3

constante solaire

$$M_S \times 4\pi R_S^2 = C \times 4\pi D_{TS}^2$$

$$C = M_S \left(\frac{R_S}{D_{TS}}\right)^2$$

② Équilibre radiatif global de la Terre



Terre $S = 4\pi R_T^2$ isotherme T_S

projetée $\Sigma = \pi R_T^2$

A = Albedo = $\frac{\text{réfléchi}}{\text{incident}}$

→ Chap 4 Absorption, diffusion

Wien $\lambda_{max} T \simeq 3000\ \mu m \cdot K$ / $\lambda_m^S \simeq 0{,}5\ \mu m$ / $\lambda_m^T \simeq 10\ \mu m$

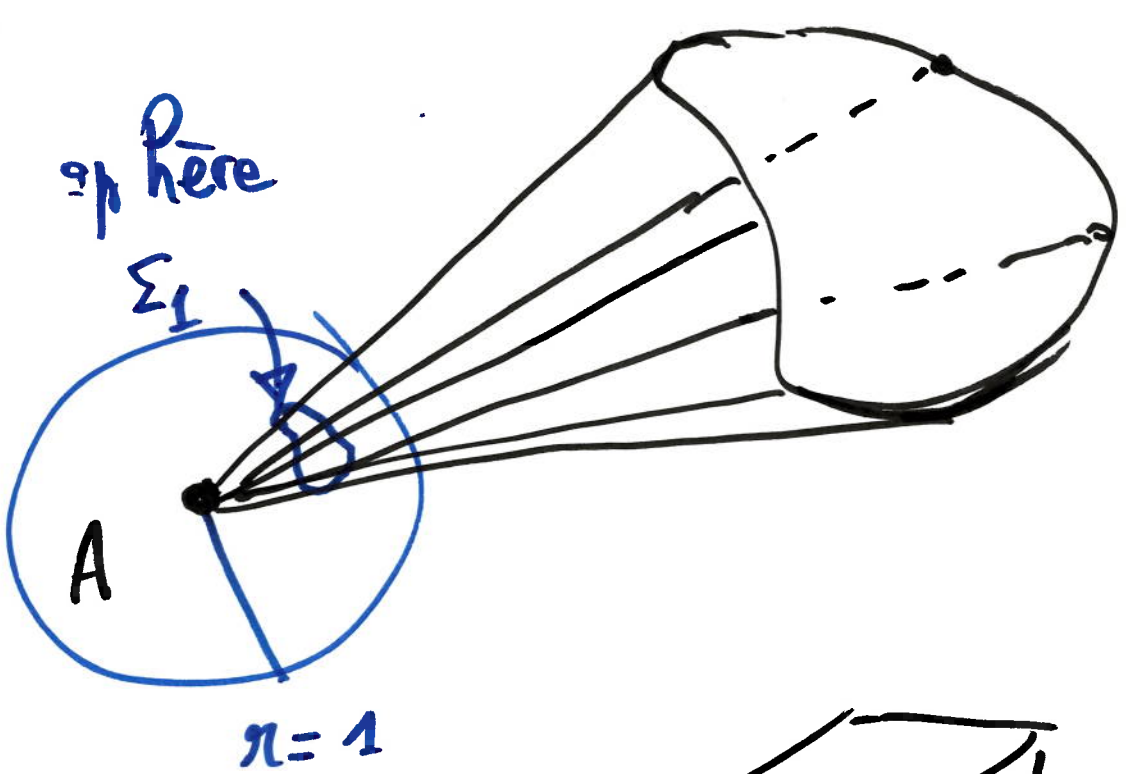
$C/4 = 343\ W m^{-2}$

$\frac{C}{4}(1-A) = M_A \uparrow$

→ Chap 5 Ray^t Solaire dans l'atmosphère

→ Chap 6 Ray^t I.R. → télédétection

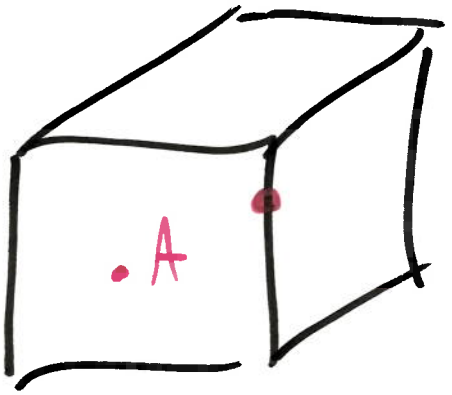
(3)



S

$$\Omega = \frac{\Sigma_1}{1^2} = \frac{\Sigma_r}{r^2}$$

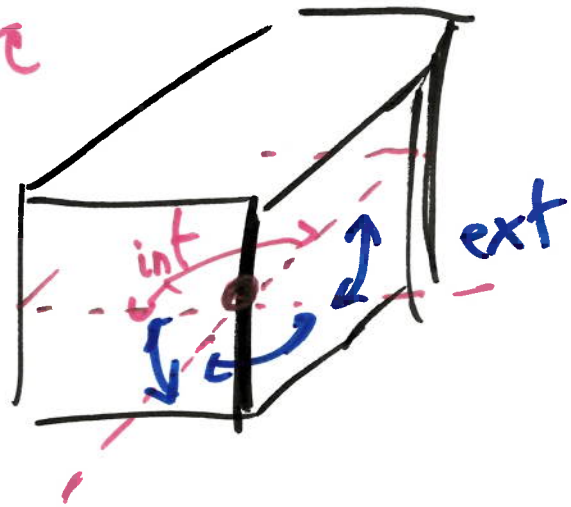
$$\Omega_{\text{tout l'espace}} = 4\pi$$



A	Ω_{int}	Ω_{ext}
intér.	4π	0
face	2π	2π
arête	π	3π
sommet	$\pi/2$	$7\pi/2$
ext	0	fct(dist)

(4)

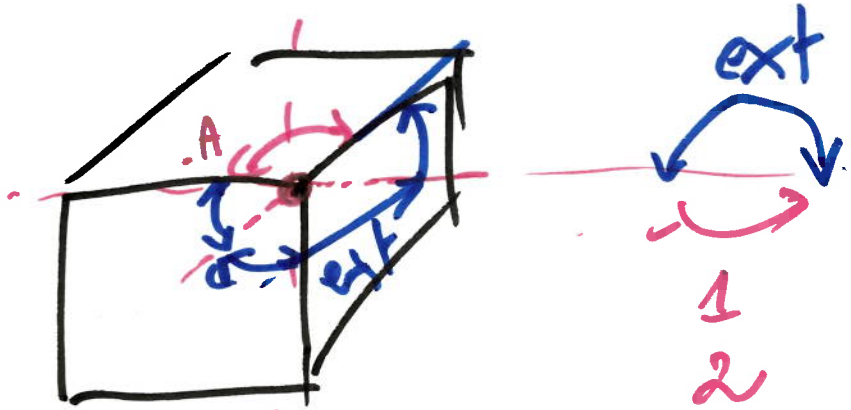
Arête



Intérieur

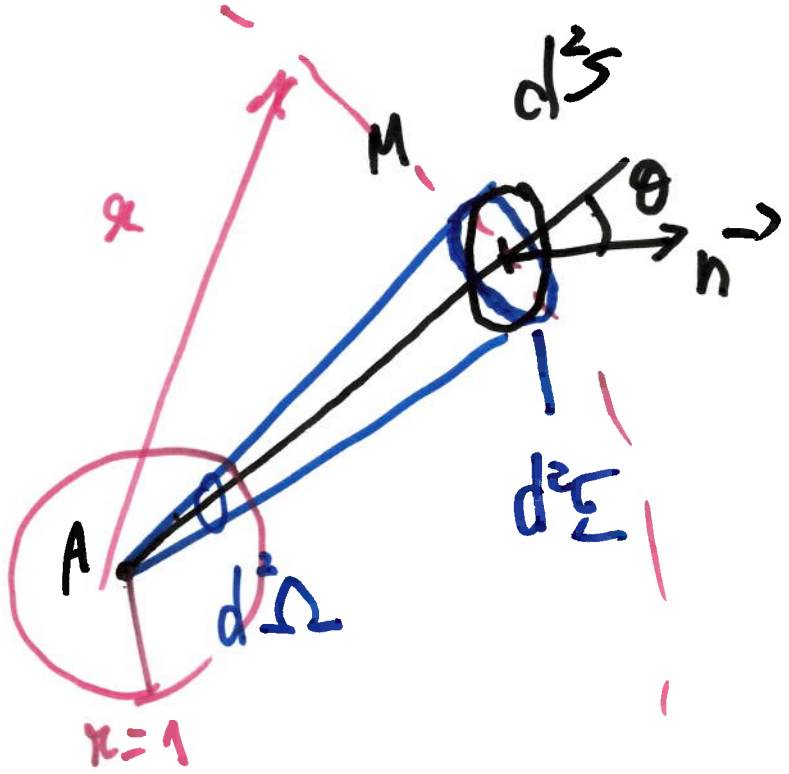
$\frac{1}{4}$

Sommet



$\frac{1}{4}$ Horiz $\times$ $\frac{1}{2}$ Vert $\Rightarrow \frac{1}{8}$

⑤ $d^2\Omega$



$$d^2\Omega = \frac{d^2\Sigma_1}{1^2} = \frac{d^2\Sigma_r}{r^2}$$

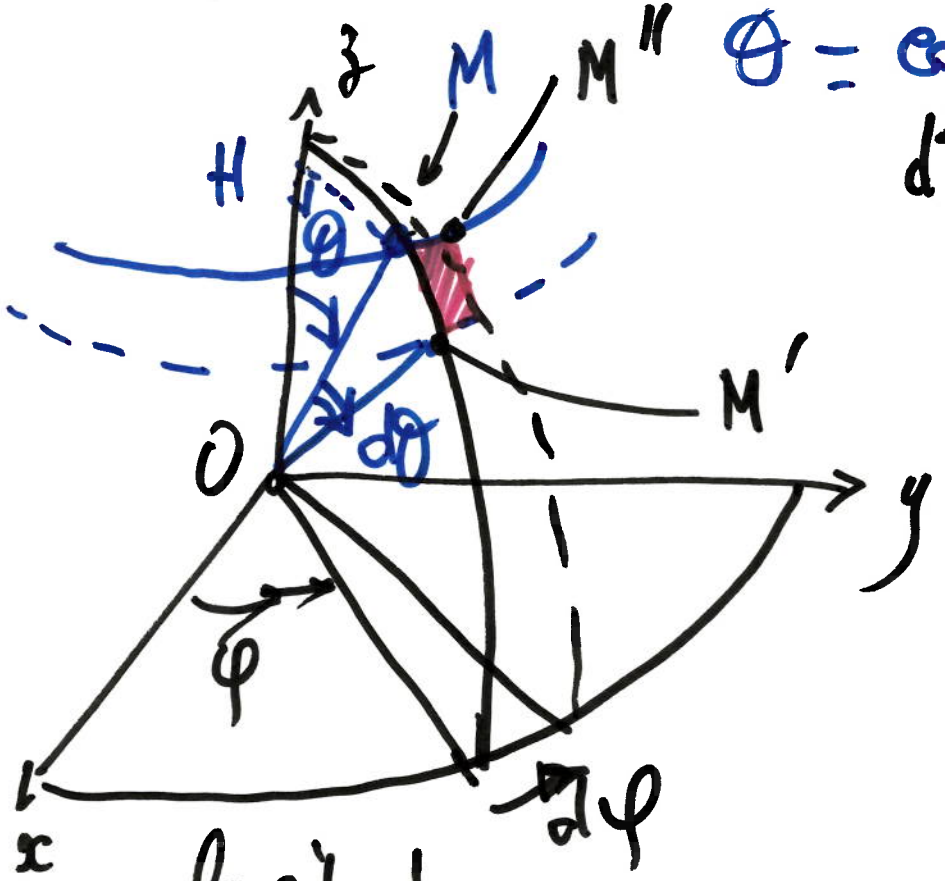
$$d^2\Sigma_r = d^2S \times \cos\theta$$

$$\boxed{d^2\Omega = \frac{d^2S\cos\theta}{r^2}}$$

$$= \frac{(\text{dist transv})^2}{(\text{dist long.})^2} \quad (\text{sr})$$

stéradian

(6) $d^2\Omega$ en sphériques



θ = colatitude

$\overrightarrow{OM} \perp d^2S$

$d^2\Sigma = d^2S = \overline{MM'} \times \overline{MM''}$

$\overline{MM'} = r\, d\theta$

méridien

$\overline{MM''} = HM\, d\varphi$

rayon du //

parallèle

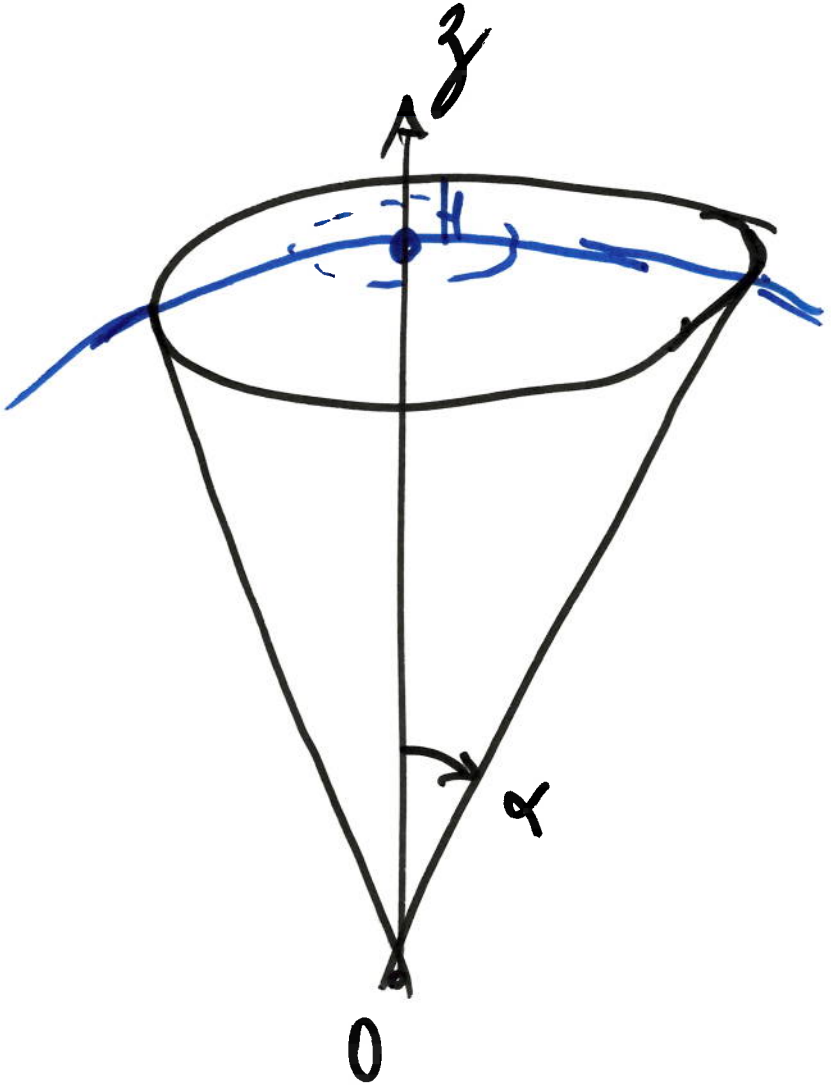
$HM = r \sin\theta$

longitude

$d^2\Sigma = r^2 \sin\theta\, d\theta\, d\varphi$

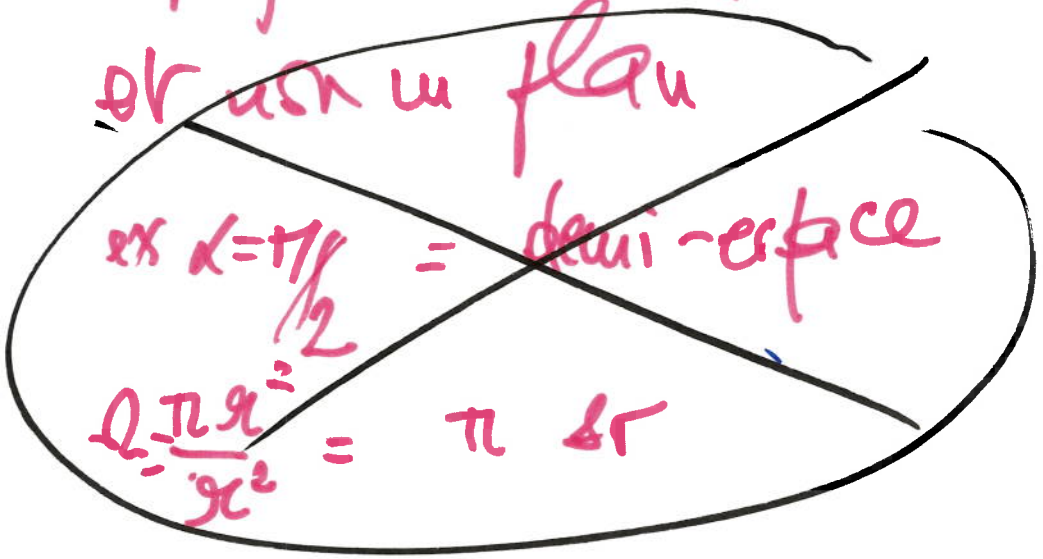
$$\boxed{d^2\Omega = \sin\theta\, d\theta\, d\varphi}$$

(7) Cas du cône de révolution Angle α



$OH = z$

① projeter sur une sphère et sur un plan



ex $\alpha = \pi/2$ demi-espace

$\Sigma = \frac{4\pi r^2}{2} = 2\pi r^2$

$\Omega = 2\pi \, dr$