

## Ejemplo 2

$$\text{cd } \ll r \quad P_r = 10 \text{ W} \quad U(\theta, \phi) = \begin{cases} B_0 \cos^3(\theta) & 0 \leq \theta \leq \frac{\pi}{2}, 0 \leq \phi \leq 2\pi \\ 0 & \frac{\pi}{2} \leq \theta \leq \pi, 0 \leq \phi \leq 2\pi \end{cases}$$

$$P_{\text{rad}} = \int_0^{2\pi} \int_0^{\pi} U(\theta, \phi) \sin\theta \, d\theta \, d\phi = \int_0^{2\pi} d\phi \int_0^{\pi/2} B_0 \cos^3(\theta) \sin(\theta) \, d\theta$$

$$= 2\pi B_0 \left( -\frac{\cos^4(\theta)}{4} \Big|_0^{\pi/2} \right) = \frac{2\pi B_0}{4} = \frac{\pi B_0}{2}$$

$$P_{\text{rad}} = 10 \text{ W} \Rightarrow \frac{\pi B_0}{2} = 10 \text{ W} \Rightarrow B_0 = \frac{20 \text{ W}}{\pi}$$

Quiero hallar  $\vec{S}_{\text{max}}$ , lo voy a dar cuando  
 $U(\theta, \phi) = U_{\text{max}} = B_0$

$$\Rightarrow \vec{S}_{\text{max}} = \frac{U_{\text{max}}}{r^2} = \frac{B_0}{r^2} = \frac{20 \text{ W}}{\pi \cdot (1000 \text{ m})^2} = 6,36 \frac{\mu\text{W}}{\text{m}^2}$$

Flex

Papirus