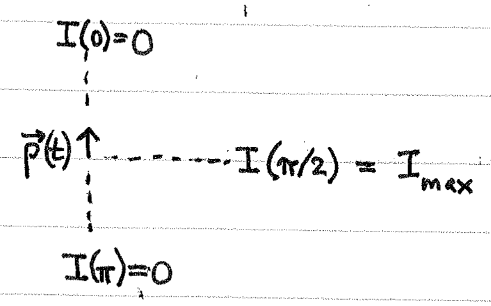
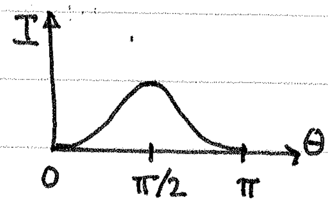
Vinkelfordeling: $E(\theta) \sim \sin\theta \Rightarrow I(\theta) \sim \sin^2\theta$
(langt unna)





Frekvensavhengighet:

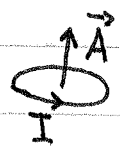
Maxwells lign. $\Rightarrow I \sim \langle \ddot{z} \rangle^2$; $\langle \ddot{z} \rangle$ = ladningenes midlere akselerasjon

$$z(t) = z_0 \sin\omega t \Rightarrow \ddot{z}(t) = -\omega^2 z_0 \sin\omega t \Rightarrow \langle \ddot{z} \rangle \sim \omega^2$$

$$\Rightarrow I \sim \omega^4$$

Utstrålt effekt: $\langle P \rangle = \dfrac{p_0^2\,\omega^4}{12\pi\varepsilon_0 c^3} \sim \omega^4$ (se f.eks. Griffiths) (Øving 8)

Tilsvarende for oscillerende <u>magnetisk dipol</u>:



$$\vec{m}(t) = I(t)\vec{A} = I_0\vec{A}\sin\omega t = \vec{m}_0 \sin\omega t$$

Utstrålt effekt: $\langle P \rangle = \dfrac{\mu_0 m_0^2 \omega^4}{12\pi c^3} \sim \omega^4$ (se f.eks. Griffiths)

For atomkjerner og atomer: $\langle P \rangle_{elek.} \gg \langle P \rangle_{magn.}$

For makroskopiske antenner: $\langle P \rangle_{elek.} \sim \langle P \rangle_{magn.}$