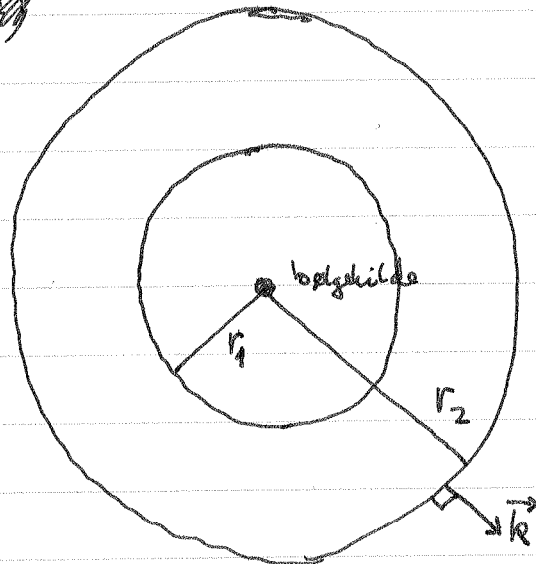


Sfæriske bølger (Kulebølger) i fluid

Fra for: $I \sim \bar{P} \sim \xi^2$

↑ ↑ ↑
intensitet middlere effekt utsving

~~Skematisering~~



kuleformede bølgefronter

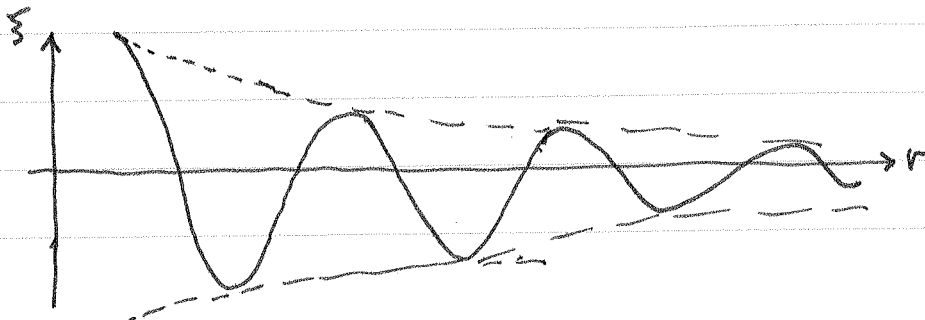
Energibevarelse $\Rightarrow \bar{P}_1 = 4\pi r_1^2 I_1 = \bar{P}_2 = 4\pi r_2^2 I_2$

$$\Rightarrow \frac{I_2}{I_1} = \frac{r_1^2}{r_2^2}$$

$$\Rightarrow I \sim 1/r^2 \quad \text{for kulebølge}$$

~~eller~~ $I \sim \xi^2 \Rightarrow \xi \sim 1/r \quad \text{for kulebølge}$

$$\Rightarrow \xi(r, t) = \frac{\xi_0}{r} \sin(kr - \omega t + \varphi)$$



Bølge-ligning:

$$\frac{\partial^2(r\xi)}{\partial t^2} = v^2 \frac{\partial^2(r\xi)}{\partial r^2}$$

$$\Rightarrow \frac{\partial^2 \xi}{\partial t^2} = v^2 \left\{ \frac{\partial^2 \xi}{\partial r^2} + \frac{2}{r} \frac{\partial \xi}{\partial r} \right\}$$