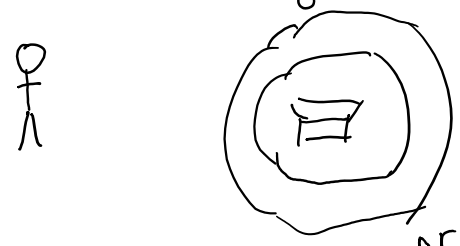
12. Dopplerův jev

Wednesday, January 15, 2025 18:27

- Pozorovatel a zdroj v klidu



$$\omega = \frac{2\pi}{T} \cdot \frac{c}{c} = \frac{2\pi c}{cT} = \frac{2\pi c}{\lambda} = \omega_0 \text{ frekvence zdroje}$$

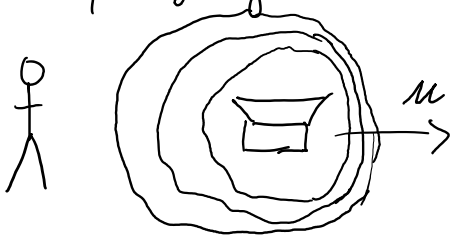
(c: rychlost šíření zvuku/informace..., $cT = \lambda$)

- Pozorovatel se pohybuje

$$\omega = \frac{2\pi(c \pm v)}{\lambda} = \frac{2\pi c}{\lambda}\left(1 \pm \frac{v}{c}\right)$$

$$\underline{\omega = \omega_0\left(1 \pm \frac{v}{c}\right)}$$

- Zdroj se pohybuje



$$\omega = \frac{2\pi c}{\lambda \pm uT} = \frac{2\pi c}{\lambda\left(1 \pm \frac{uT}{\lambda}\right)} = \underbrace{\frac{2\pi c}{\lambda}}_{\omega_0} \cdot \frac{1}{1 \pm \frac{u}{c}}$$

($\frac{uT}{\lambda} = \frac{u}{c}$)

$$\underline{\omega = \omega_0\left(1 \mp \frac{u}{c}\right)}$$

$(1+x)^n \doteq 1 + nx \quad x \ll 1$