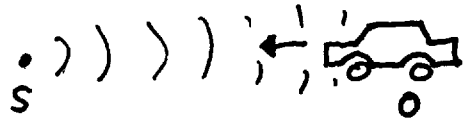
Doppler

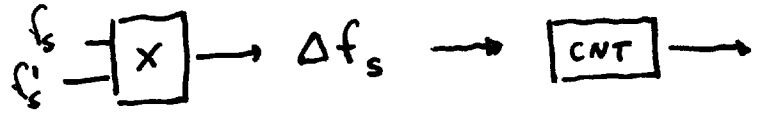


$f_s = 3\,6\,Hz$

$$f_s' = \left(\frac{V + V_o}{V - V_o}\right) f_s$$

$$\approx \left[1 + \frac{2V_o}{V}\right] f_s$$

$$\Delta f_s = f_s' - f_s = \frac{2V_o}{V} f_s$$



$$V_o = \frac{\Delta f_s}{f_s} \cdot \frac{V}{2}$$

$$\text{resolution } V_o = \text{resolution } (\Delta f_s) \cdot \frac{V}{2 f_s}$$

$$\left.\begin{aligned} \text{resolution } \Delta f_s &= 1\ Hz \\ V &= 3 \times 10^8\ m/s \\ f_s &= 3\ GHz \end{aligned}\right\} \quad \Delta V_o = 0.1\ m/s$$

$$\text{resolution } V_o = 0.1\ m/s = 0.36\ km/h$$