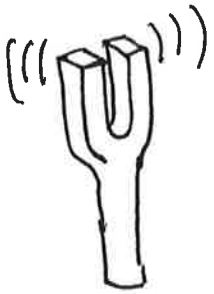
TL 5-20 (Tuning fork)



- Tuning fork frequency $f = 880\,\text{Hz}$
- Measuring time $\Delta t = \frac{1}{4}$ sec.
- Using the classical uncertainty principle, which is based on fourier analysis, we can find the uncertainty in frequency $\Delta\omega$, based on Δt:

$$\Delta\omega\,\Delta t \sim 1$$

$$\Delta\omega \sim \frac{1}{\Delta t}$$

- Since $\frac{\omega}{2\pi} = f$, thus $\Delta f \approx \frac{\Delta\omega}{2\pi} \approx \frac{1}{2\pi\Delta t}$

$$\Delta f \approx \frac{4}{2\pi} \approx \frac{2}{3}$$

- So the measured frequency is

$$\boxed{f = 880 \pm \tfrac{1}{3}\ \text{Hz}}$$