

Stuff for Friday, March 30, 2012

- Stop at 4:05pm for closed-book Quiz 1 (on Q1 and Q2)
- Are you checking the course web page? E.g., new assignments, solutions for 1094, PS#1, etc.
- Any questions on PS#2?
- Photoelectric effect on Monday. Preview with applet.
- Two-slit interference with slit separation d

$$d \sin \theta_{nc} = n\lambda \implies \theta_{nc} = \sin^{-1} \frac{n\lambda}{d} \approx \frac{n\lambda}{d} \quad (\text{constructive})$$

- Diffraction: waves spread when passing through “slit” of width a

$$a \sin \theta_{nd} = n\lambda \implies \theta_{nd} = \sin^{-1} \frac{n\lambda}{a} \approx \frac{n\lambda}{a} \quad (\text{destructive})$$

- Fourier transform coefficients A_n for square wave:

$$f(x) = \begin{cases} -A & \text{for } -L/2 \leq x < 0 \\ A & \text{for } 0 \leq x < L/2 \end{cases}$$

$$f(x) = \sum_{n=1}^{\infty} A_n \sin\left(\frac{2\pi nx}{L}\right) \implies A_m = \int_{-L/2}^{L/2} \sin\left(\frac{2\pi mx}{L}\right) f(x) dx = \begin{cases} 0 & \text{if } m \text{ even} \\ \frac{A}{4\pi} \frac{1}{m} & \text{if } m \text{ odd} \end{cases}$$