

CONTACT INFO (AGAIN)

PHYS @ stanford.edu

AIM: fliptomato

PH: EUCALYPTO 240

← I'M HAPPY TO ANSWER QUESTIONS VIA EMAIL 24 HRS TURN AROUND
 ← IF I'M ONLINE YOU CAN ASK ME Q'S.
 ← I SLEEP @ MIDNIGHT
 BUT IF YOU WAKE UP / FREAK OUT MY ROOMMATE,
 I'LL BE PLEASANTLY AMUSED!!

ANNOUNCEMENTS

- OFFICE HOURS THIS WEEK:
THURSDAY AFTERNOON
OR VIA E-MAIL / APPOINTMENT
I WILL BE OUT OF TOWN @ THE CUEVAZCA NAT. TRIATHLON THIS WEEKEND.
- REGULAR OFFICE HOURS - WE'LL HAVE TO CHANGE PLACE (IF YOU DON'T WANT UNDERGRADS USING THEIR ROOM!!)
→ 4TH FLOOR
→ LAGUNITA (CLOSE TO MY ROOM, LATE NITE)

CHAPTER 9 → WAVESWHY YOU SHOULD CARE

- MATHEMATICAL TOOLS ARE USED ALL OVER PHYSICS (WAVE EQUATION)
- MOST REAL WORLD APPLICATIONS
- EXPLAINS ALL SORTS OF OPTICAL PHENOMENA

ROAD MAP9.1 WAVES IN 1D: AN IMITATION $f'' = \frac{1}{v} \ddot{f}$ SINUSOIDAL SOLUTION: $f(z,t) = A \cos[k(z-vt) + \phi]$

↑ WAVE # (DIM ?)
 ↑ IN GENERAL $f(z,t) = \hat{f}(z-vt)$
 SEE WHY IT'S A WAVE

$$\lambda = \frac{2\pi}{k}$$

$$T = \frac{2\pi}{\omega}$$

$$v = \frac{\omega}{k}$$

$$\omega = 2\pi\nu$$

→ DO YOU SEE WHY?

→ $= \nu / \lambda$

→ # RADIANS / TIME

} UNDERSTAND THESE DIMENSIONALLY

$$f(z,t) = \text{Re}(A e^{i(kz - \omega t + \phi)})$$

→ RC NEEDED TO SOLVE PDE

POLARIZATION (TRANSVERSE WAVES)

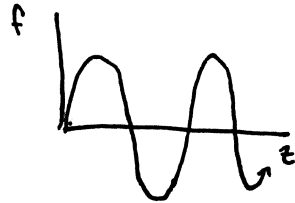
JUST STICK A DIRECTION ON IT!

WAVE PROPAGATES IN A DIRECTION (\hat{z})
OSCILLATES IN ANOTHER (\hat{x})

... ACTUALLY OSCILLATES IN SPACE AND TIME (\hat{x}, t)

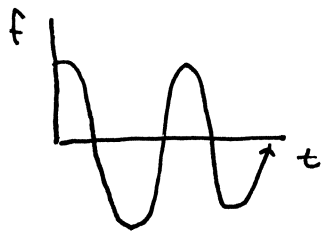
SOME "MORE OBVIOUS THAN OBVIOUS" CLARIFICATION* \leftarrow *: PHRASE FROM COMU 2EE

CAN DRAW WAVE AS FUNCTION OF SPACE (z)



for $t = \text{CONST}$
(A SLICE IN t)

OR AS A FUNCTION OF TIME (t)

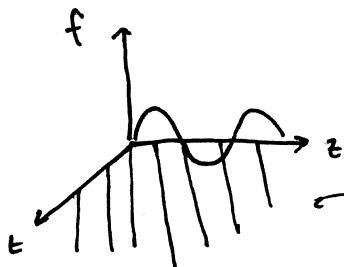


(not nec. same phase, depends on slice of z)

THESE ARE JUST CROSS SECTIONS OF THE WAVE AS A FUNCTION OF z AND t

$$f(z,t) = \bar{f}(z-vt)$$

for $z-vt = \text{CONST}$, f HAS VALUE.



\leftarrow LINES OF CONSTANT f

