

PHY100S - The Magic of Physics - Class 9

Why did the chicken cross the road?

Aristotle: It is the nature of chickens to cross the road.

Newton: Because no force caused the chicken's state of uniform road crossing to change.

Einstein: Is the chicken crossing the road, or is the road moving under the chicken?

§9.3 What is light?

waves need a medium.

for light: "Luminiferous ether"

sound wave: speed ~ 1200 km/hr
wrt medium, i.e. air

"with respect to"

light: $1,079,253,000$ km/hr
wrt ether

CHAPTER 10

§10.1 - NTA "nothing to add"

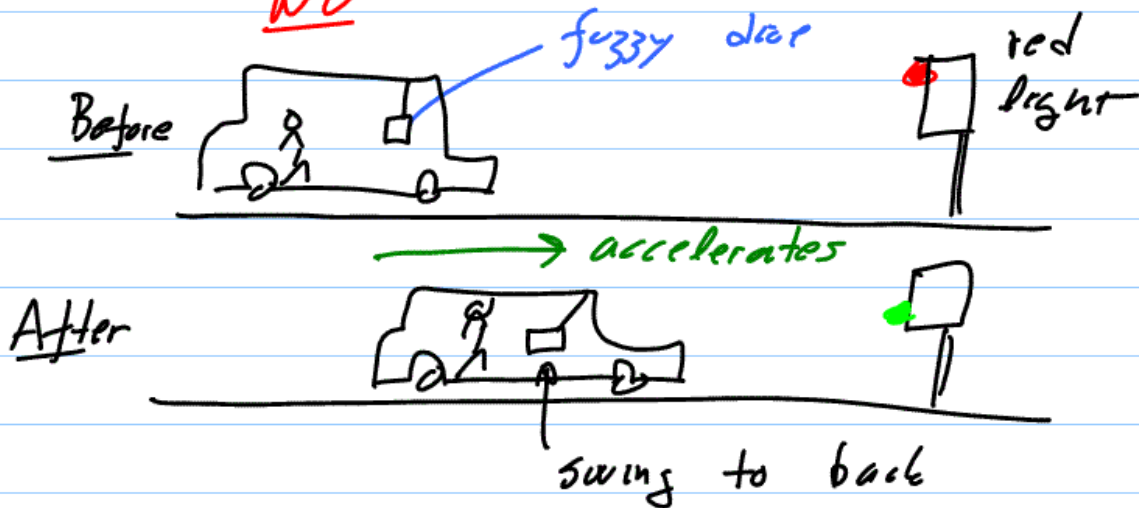
§10.2 - 10.5 - a little different

Galilean Relativity

Principle of Inertia true
for both observers

True for all observers?

NO





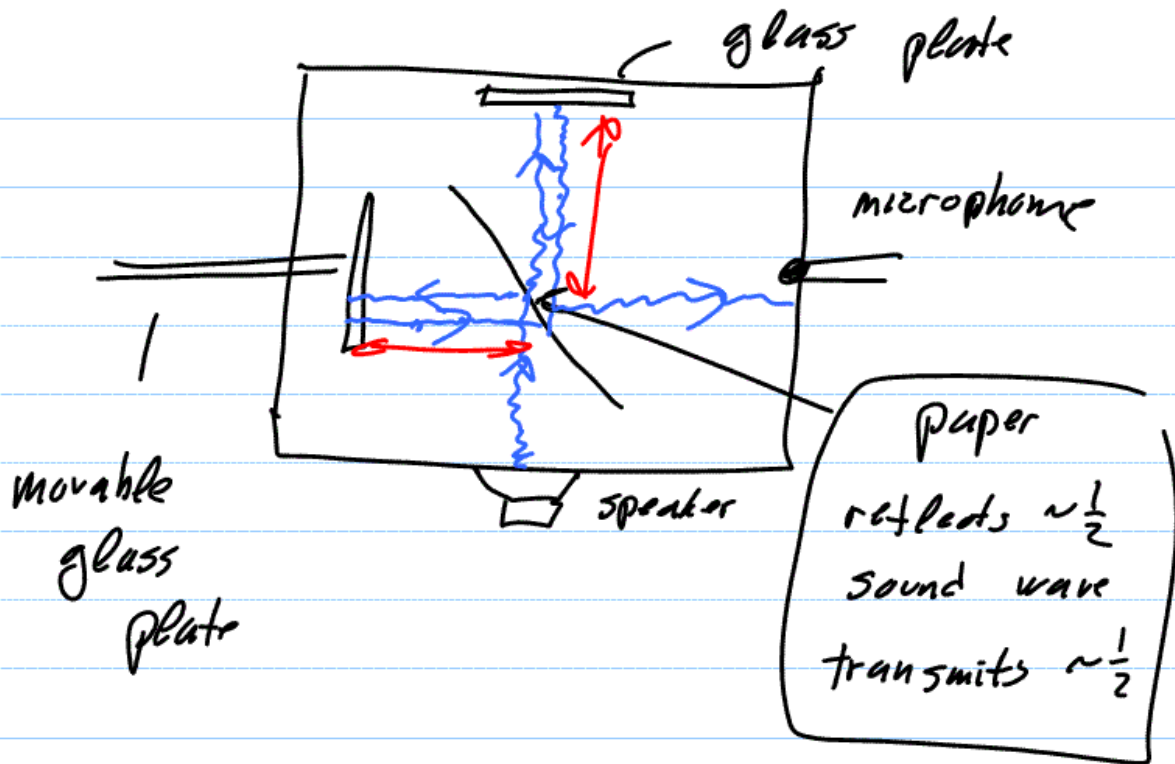
dice stationary until
they swing back {
string exerts a horizontal
force on them

Princ. of Inertia only true
for non-accelerating
observers

"Inertial Reference Frames"

Michelson-Morley Expt (1887)

Acoustic Michelson Interferometer



distances same! constructive interf

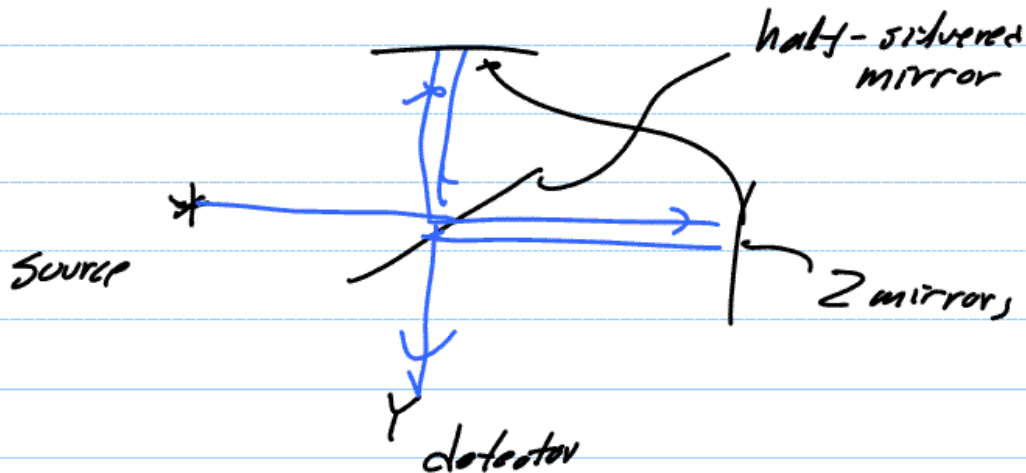
move a reflector to right

construct \Rightarrow destruct \Rightarrow
 construct \Rightarrow ...

If a wind blows from left to right'

equal distances may not
give constructive interference.

Michelson Light Interferometer



speed earth wrt ether $\sim 100,000 \frac{\text{km}}{\text{hr}}$

Michelson-Morley Expt to
measure this speed.