

PHY100S - The Magic of Physics - Class 10

Poincare in 1902: "There is no absolute space, no absolute time, no simultaneity across distance, not even geometry. These concepts are no more than a language."

Michelson - Morley Expt'

result speed of c
wrt ether is
consistent with zero.

Einstein (1905):

⇒

Speed of light in empty space same value for all non-accelerating observers

All of spec. relativity

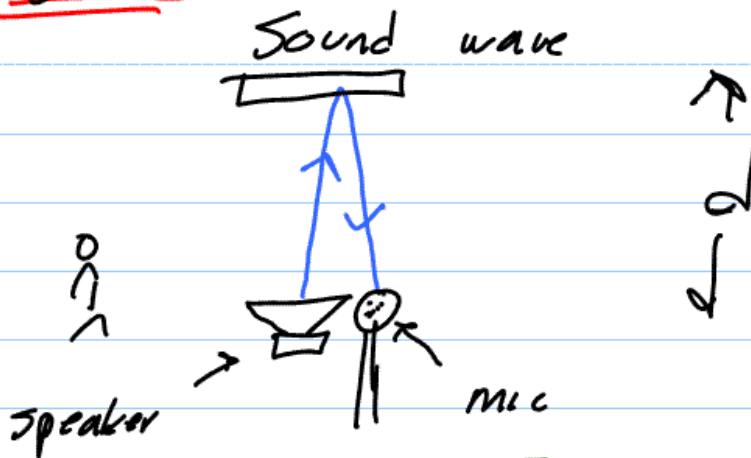
Einstein (1895 - age 16):

chase beam of light
at c .

What do I see?

Ether "superfluous"

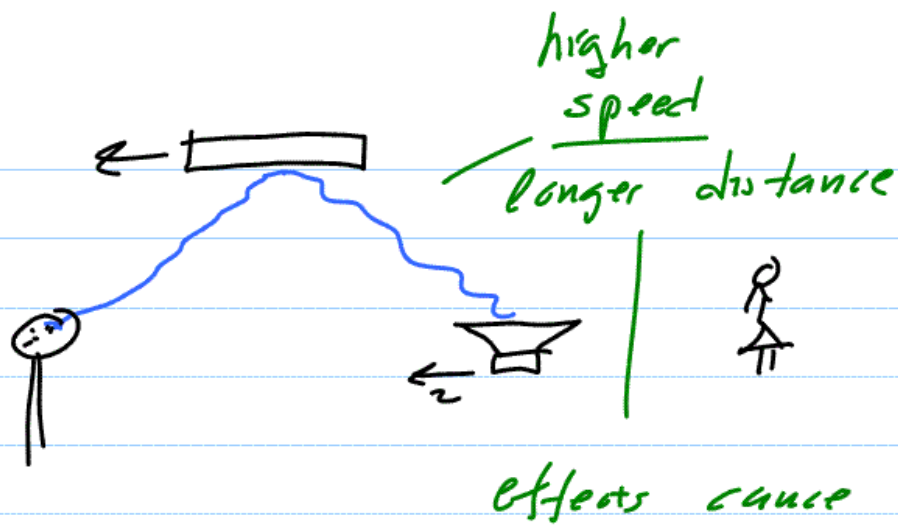
§10.6



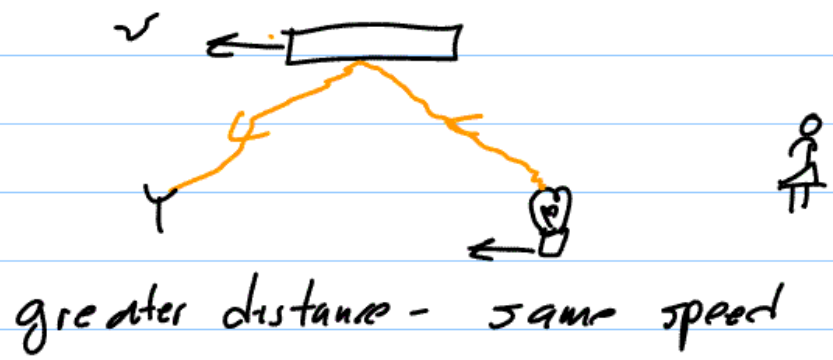
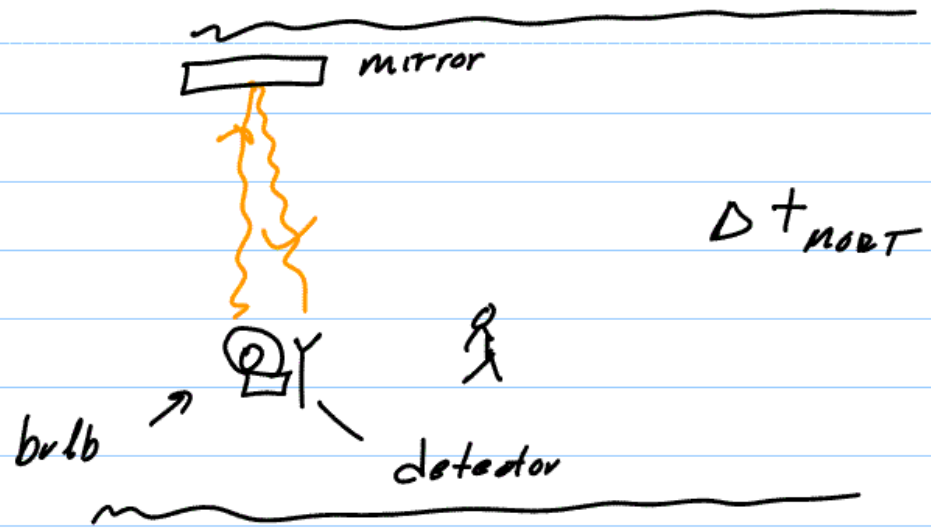
2 events! [① sound leaves the speaker
② sound enters the mic

total distance $2d$ Δt_{MORT}

Delta
difference



$$\Delta t_{VELMA} = \Delta t_{MORT}$$

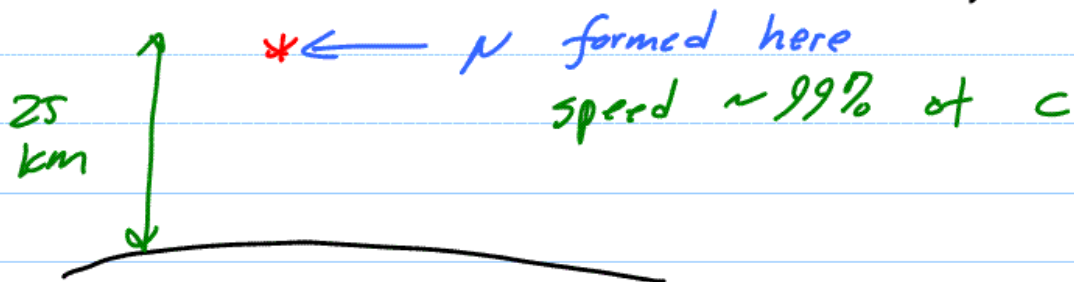


Δt_{VELMA} greater than Δt_{MORT}

Test cosmic ray "muon" μ

in lab - unstable

lifetime = 2.196 μs



99% of $c \times 2.196 \mu\text{s} =$
650 meters until
they decay.

BUT - they reach the Earth!