

Title: Special Relativity 5 - Einstein's Relativity Principle ("Principle 1")

Date: Aug 11, 2008 09:00 AM

URL: <http://pirsa.org/08080064>

Abstract: Einstein's Relativity Principle applies to both mechanical and electromagnetic phenomena.

Learning Outcomes:

â€¢ Understanding Einstein's Relativity Principle: "Given any two inertial observers in uniform relative motion, both are equally entitled to consider themselves to be 'at rest'."

â€¢ Einstein based special relativity on Principles 1 and 2, which are both natural and easy to believe.

â€¢ Logically, Principles 1 and 2 imply Principle 2*. It is the role of special relativity to show how Principle 2* makes sense, but it requires a complete revision of our concepts of space and time.

Obvious

- (1) Mechanical wave-in-ether model of light predicts this.
- (2) Maxwell's equations predict this ✓
- (3) Astronomical Observations

P2: (Speed of Light)

there exists at least one frame
in which this is true.

For an observer "at rest", the speed of
light is c , independent of the motion of the source

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PI: (Relativity)

Given any two inertial observers in uniform relative motion, both are equally entitled to consider themselves to be "at rest".

PI: (Relativity)

not accelerating
or rotating

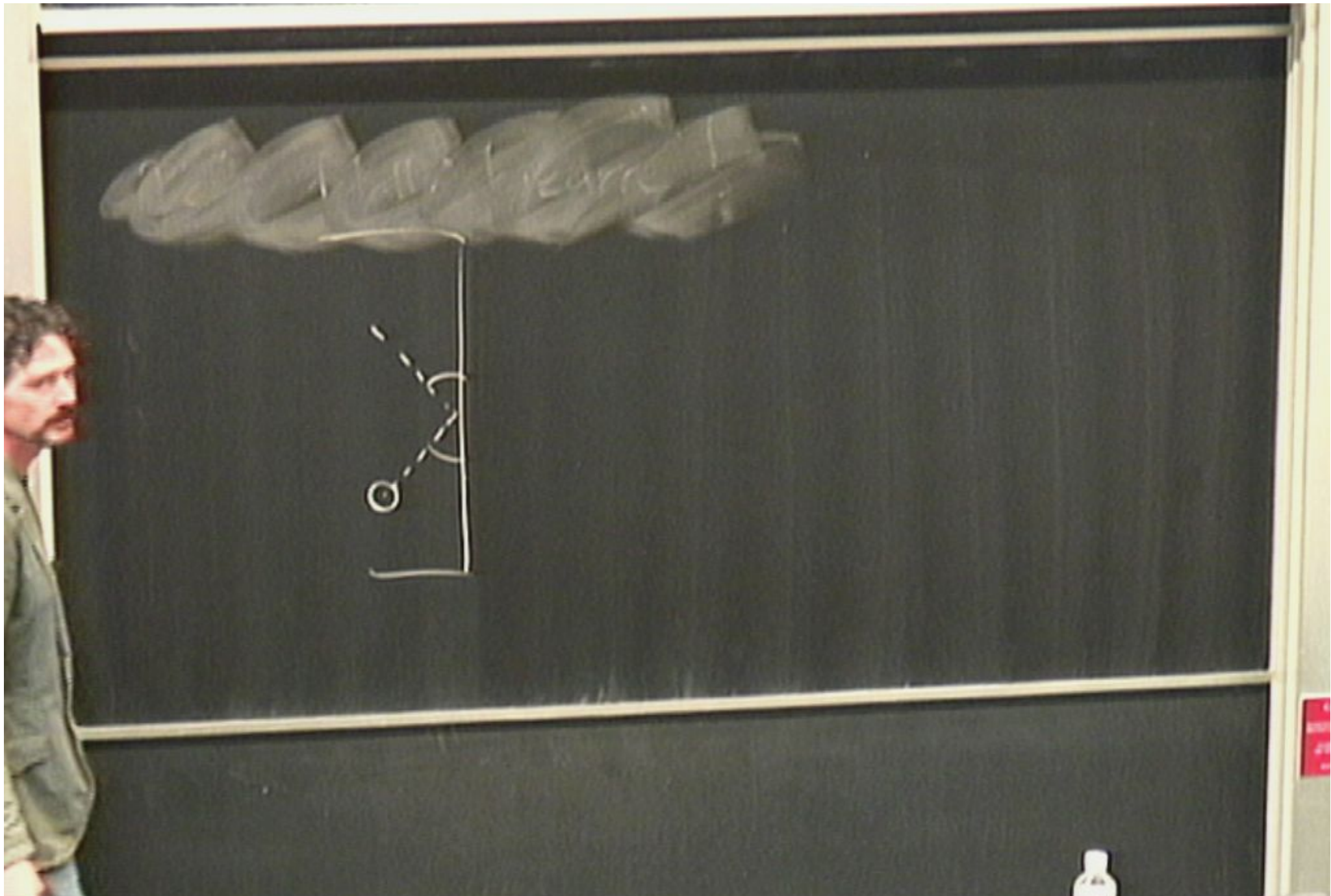
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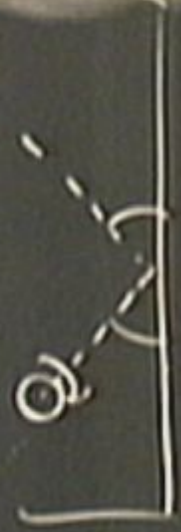
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Given any two inertial observers in uniform

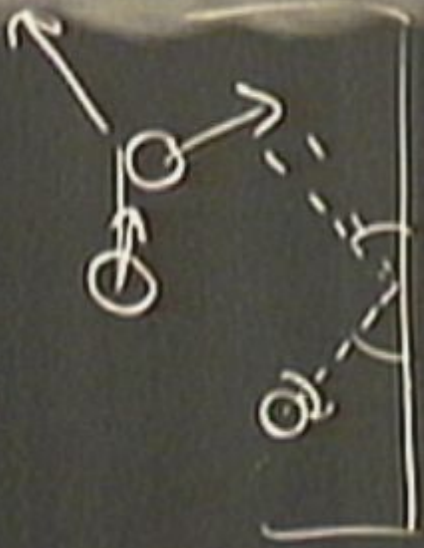
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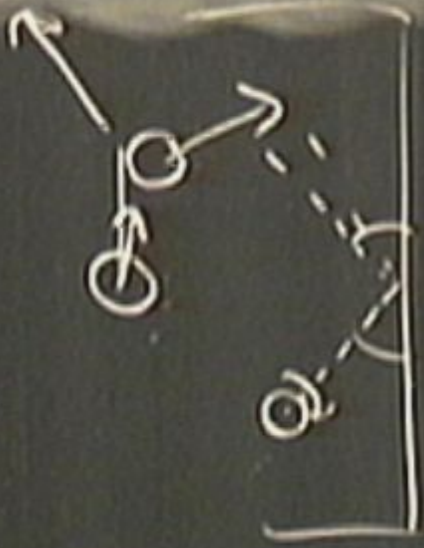
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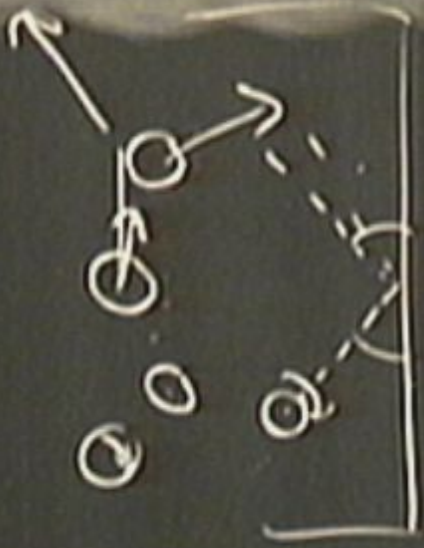
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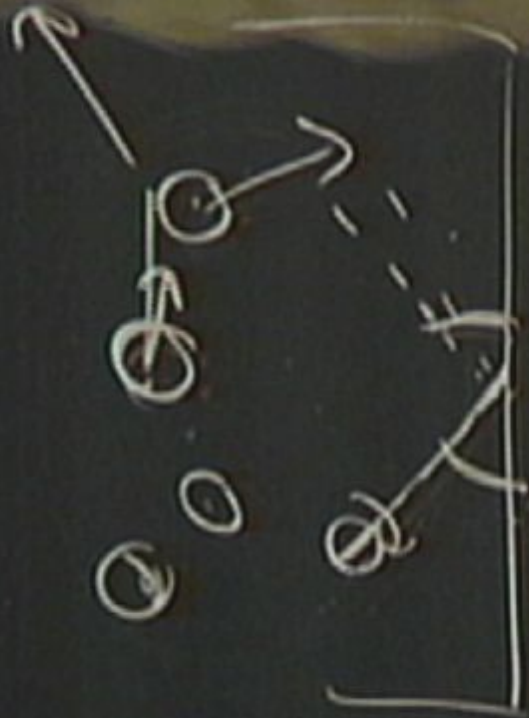


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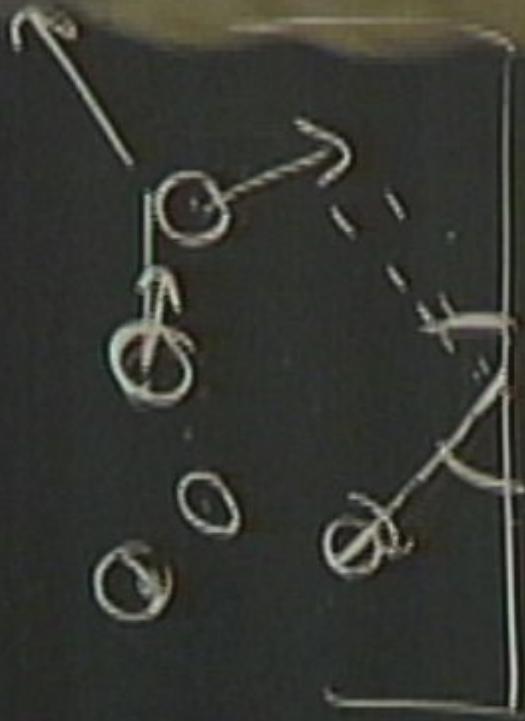


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* No way to determine velocity of train based on observing behaviour of balls.



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Not obvious for elm. phenomena.

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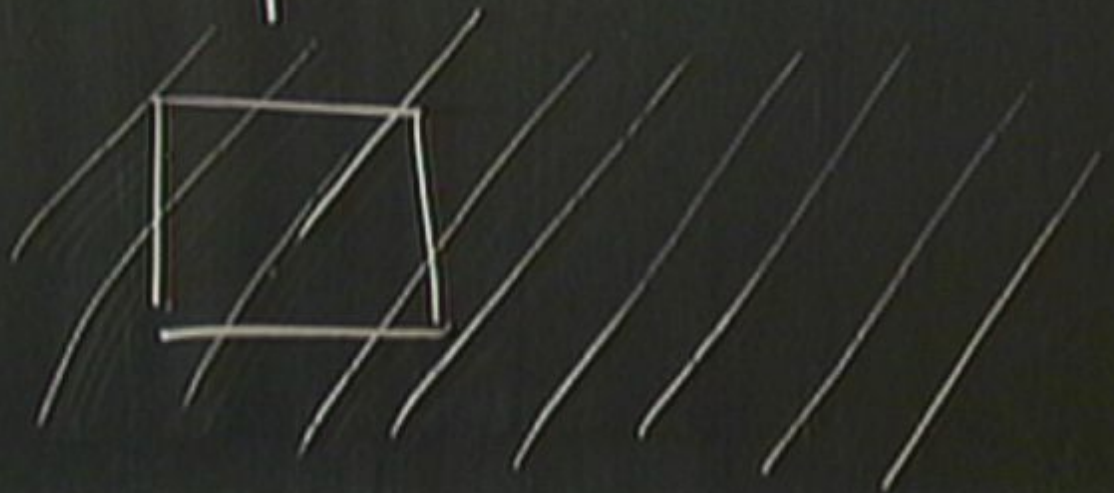
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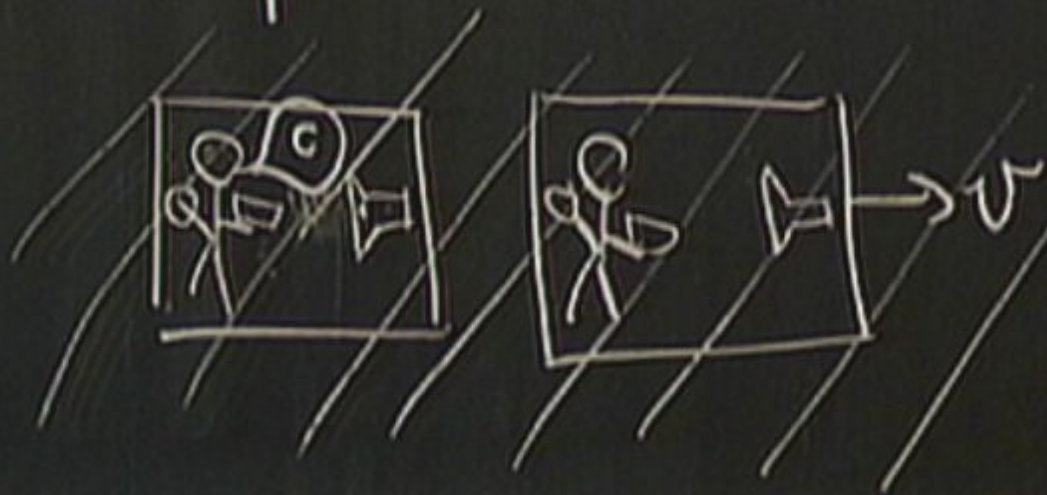
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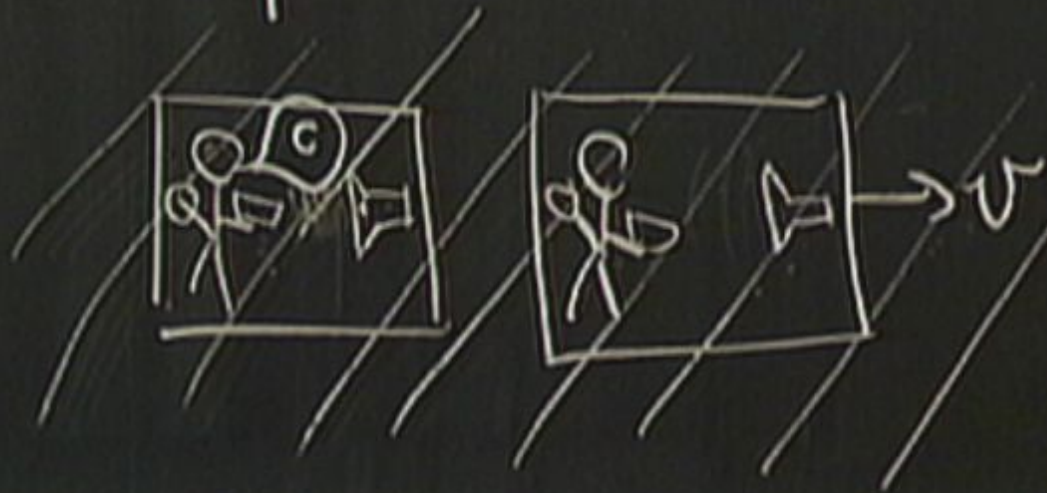
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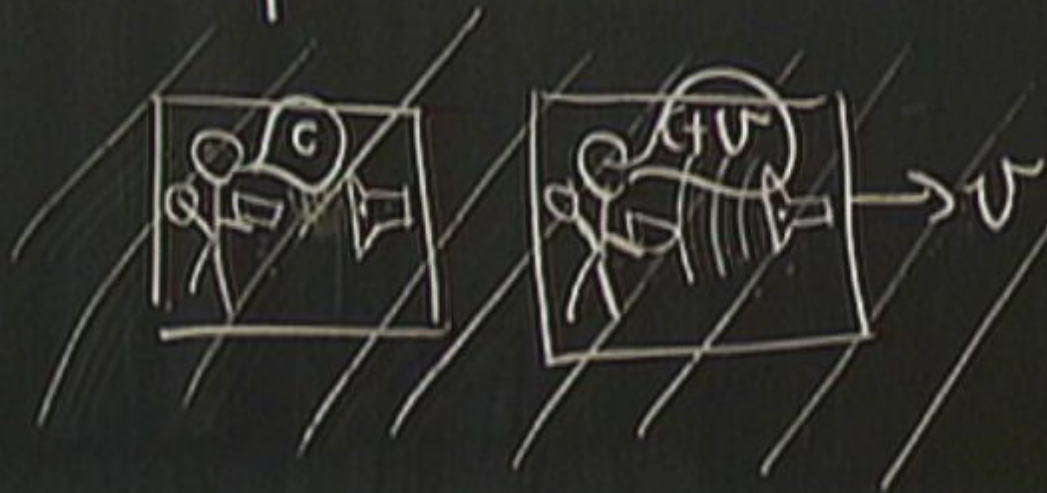
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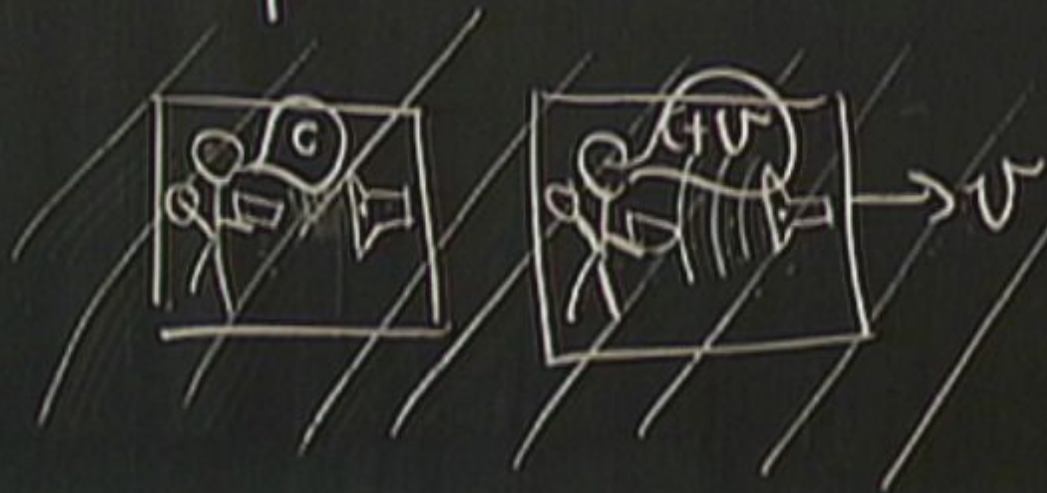
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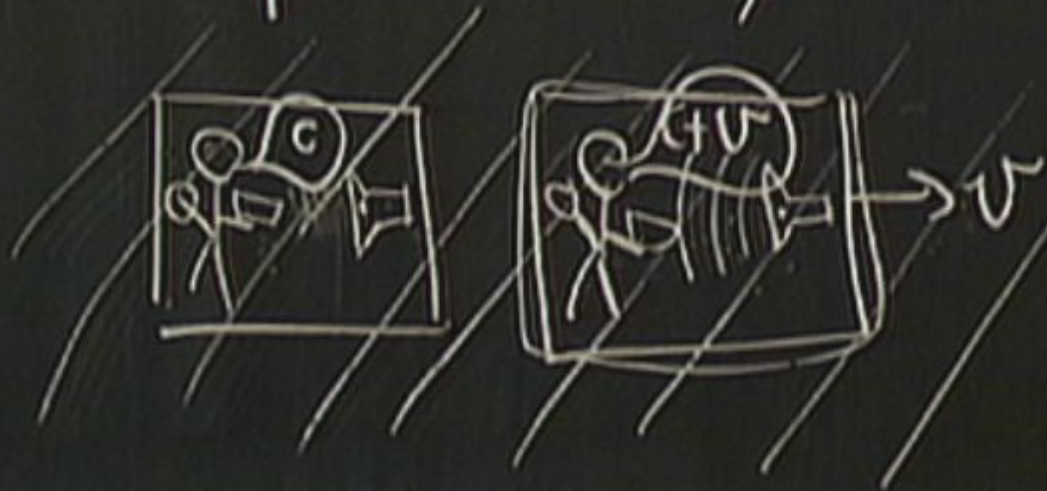
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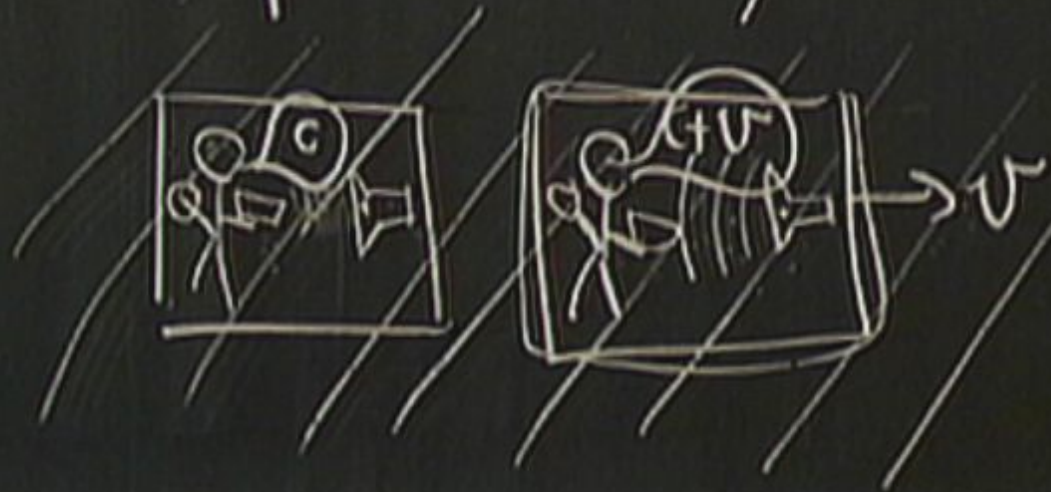


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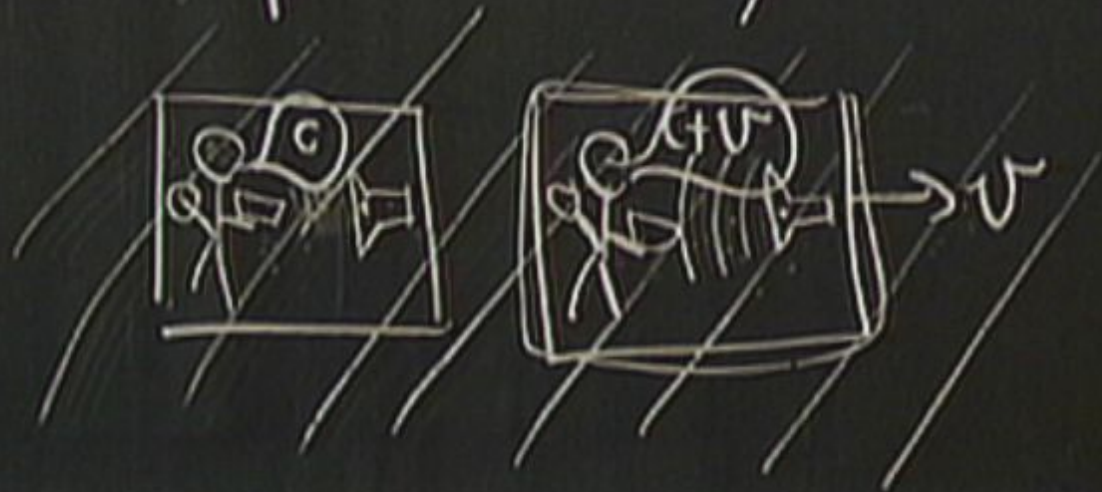


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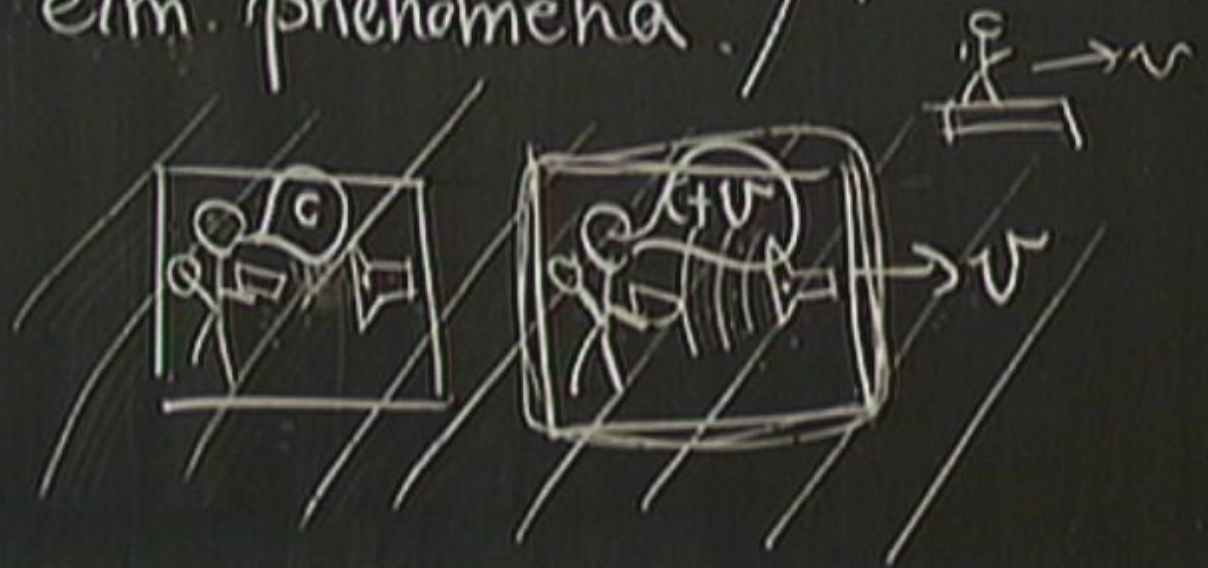


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