Numerical problems on Newtonian relativity

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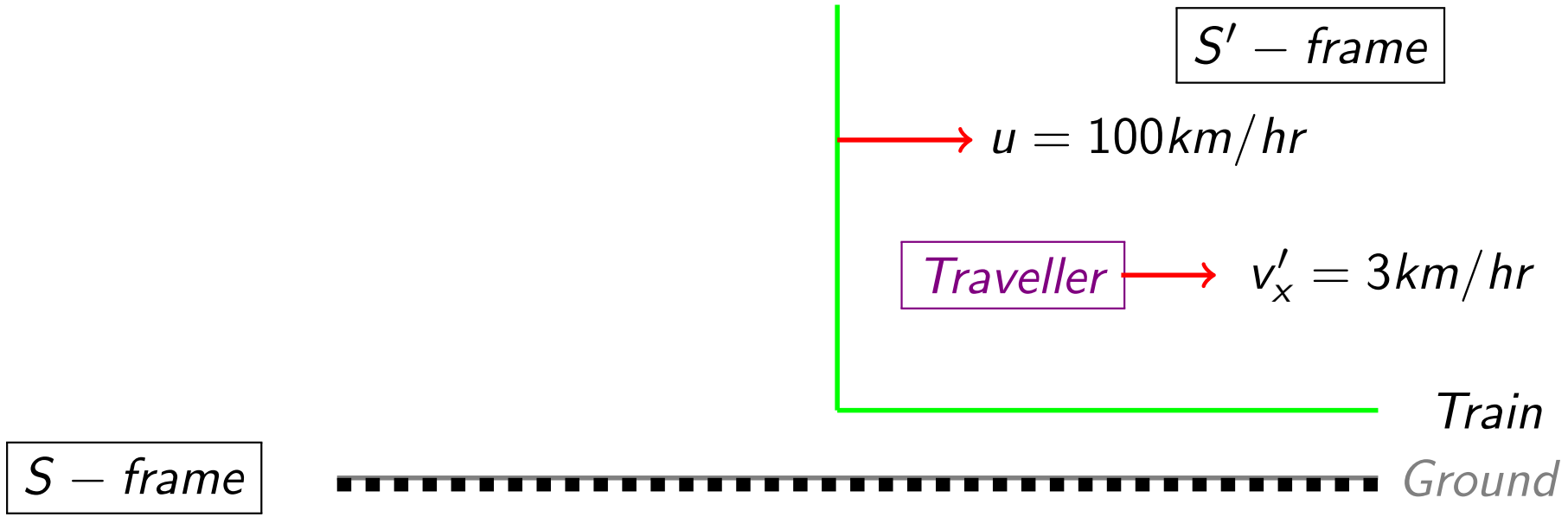
Outline

Question # 1

A train is moving at speed 100km/hr relative to ground along a straight track. A passanger of the train moves forward along the aisle of the train at speed of 3km/hr. What is the passenger's speed with respect to the ground?

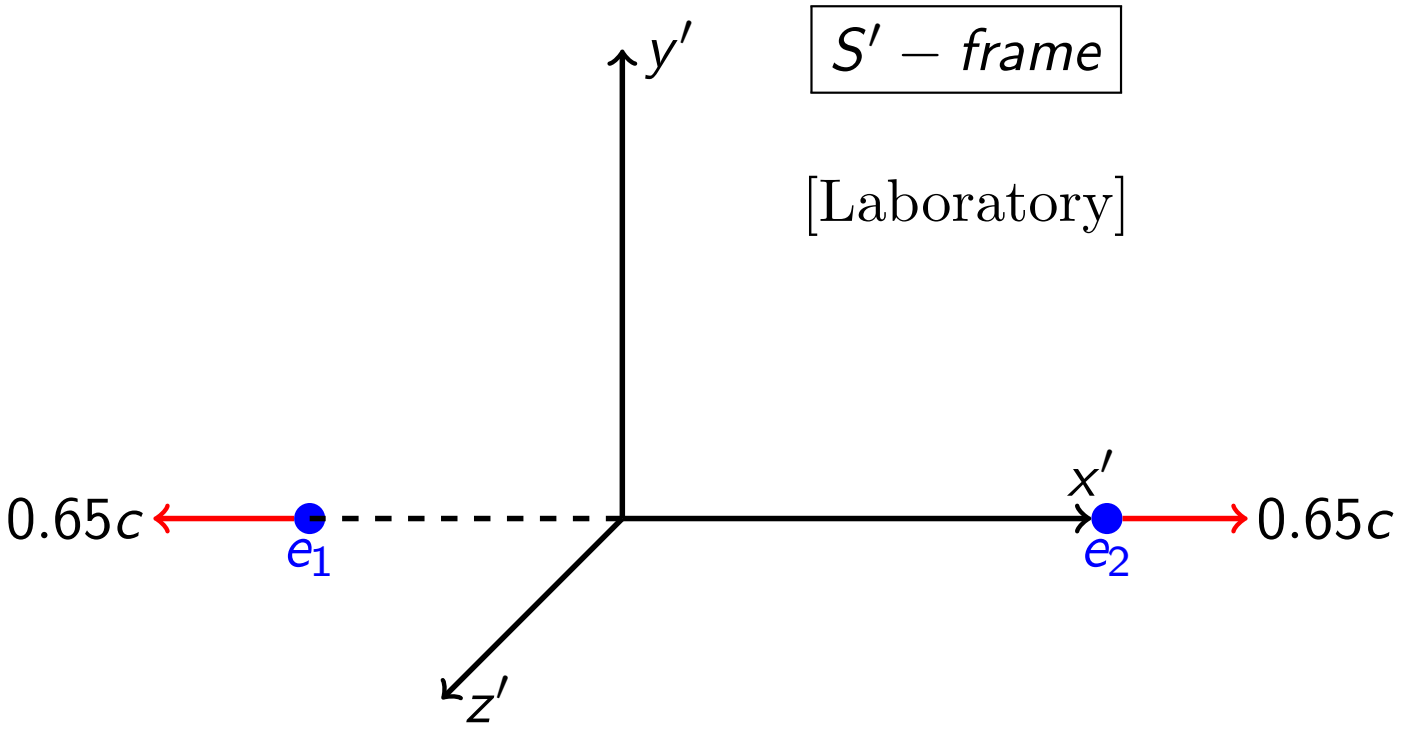


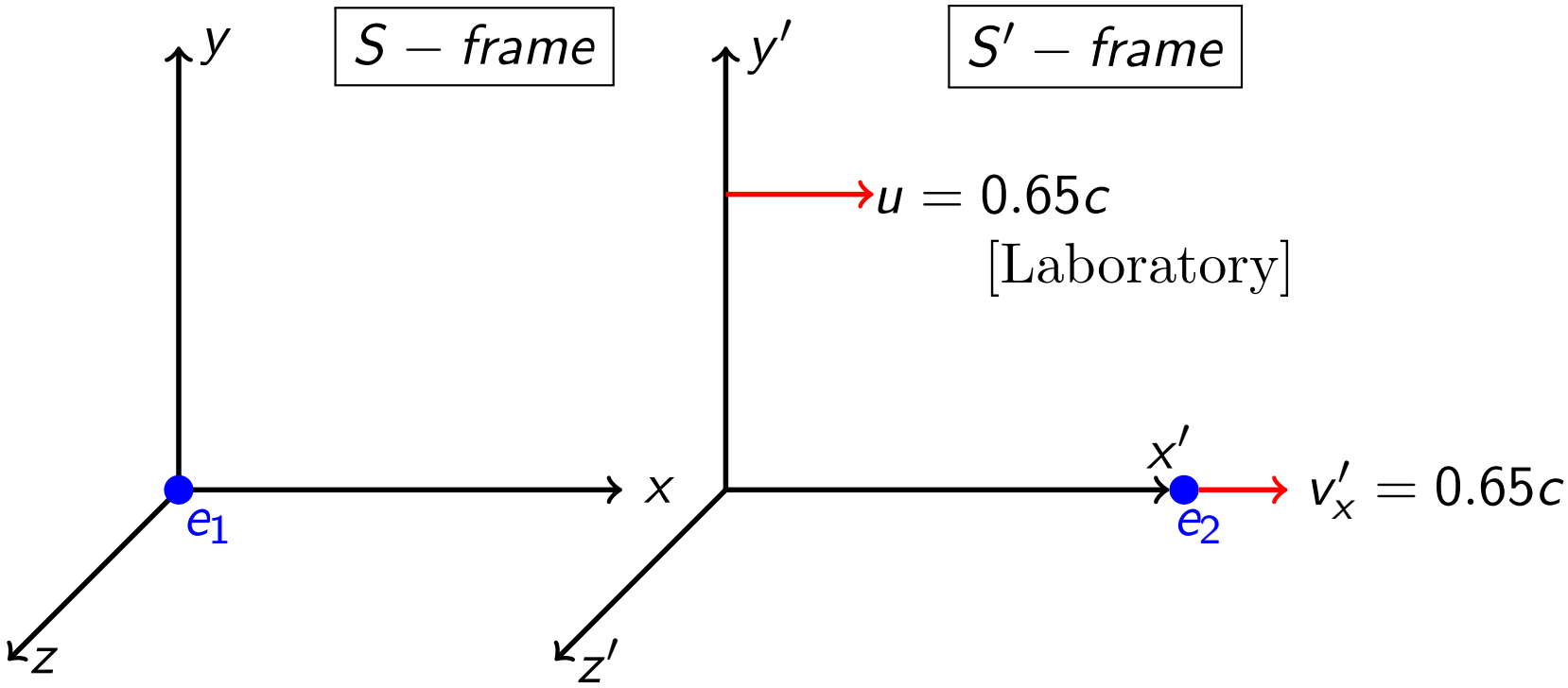
Use classical velocity addition theorem,

$$v_x = v'_x + u = 3km/hr + 100km/hr = 103km/hr.$$

Question # 2

Question: Two electrons are ejected in opposite directions from a radioactive element at rest in a laboratory. Each electron has a speed 0.65c as measured by the laboratory observer. Using the classical velocity addition theorem, obtain the speed of one electron as measured from the other.


y'
$S' - frame$
[Laboratory]
x'
$0.65c$
e_1
e_2
$0.65c$
z'



Use classical velocity addition theorem,

$v_x = v'_x + u = 0.65c + 0.65c = 1.30c$. See the result, particle speed is greater than speed of light in free space!

Thank You

Stay Home Stay Safe