

Physics 262: Homework #12

1. (1 point) Draw a Minkowski Diagram for the situation where S' has velocity $\vec{V} = \hat{i}0.5c$. Give the angle that the x' and ct' axes make with respect to the S reference frame axes. Draw the worldline of light.
2. (1 point) In a Minkowski diagram, (S' has velocity $\vec{V} = \hat{i}V$) show two events, A and B where A happens before B in the S reference frame. Is it possible that B happens before A in S' ? If so, what conditions need to be satisfied? Show an example using the diagram.
3. (1 point) If the path length of each arm of the interferometer in a Michelson-Morley type experiment is 10 m, how many fringe shifts would be expected when rotating the interferometer by 90 degrees if the 'ether' theory was correct? Use $\lambda=500$ nm, if necessary.