

Phys 220 - Friction

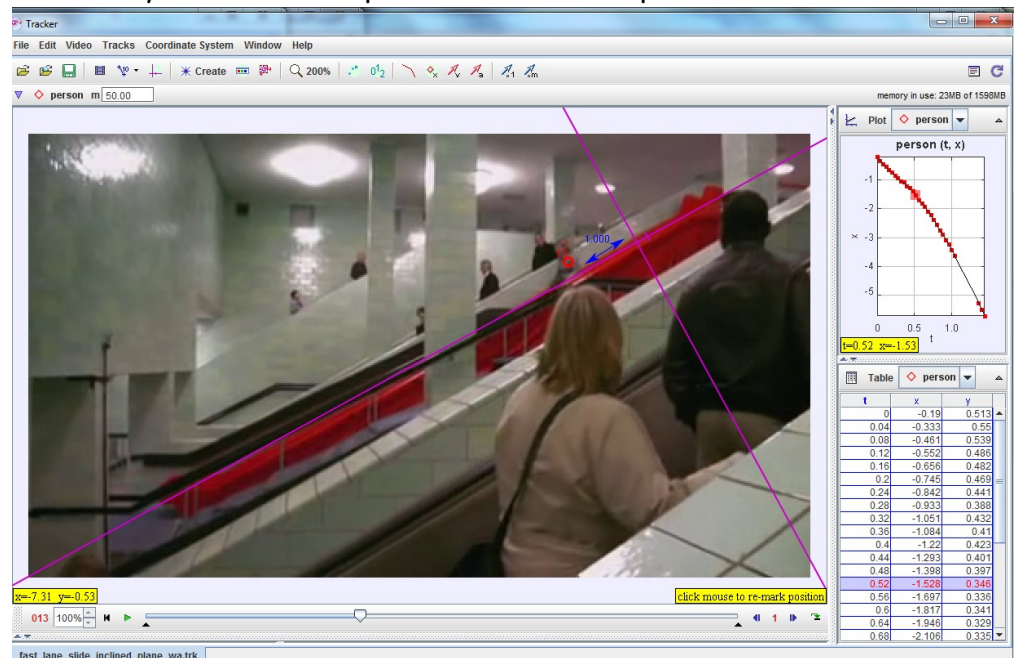
Watch the video of the "Fast Lane" Subway Slide:

<http://www.youtube.com/watch?v=W4oOZVeixYU>

Analysis

You will use the video analysis software, Tracker, to determine the coefficient of kinetic friction for one of the sliders. We picked the lady sliding in the video from the 44 to 46 second time frames because this shot provides a clear side view of the slide.

Your Tracker "fast_lane_slide_inclined_plane.trk" file contains the two seconds of the movie clip from 44 to 46 seconds. A coordinate system has been placed and data for position versus time has been plotted.



1. Open the .trk file on your desktop.
2. Right click on the data Plot and choose Analyze.
3. In your Data Tool window click "fit". Below the data choose "Fit Name: Parabola". Why choose Parabola rather than Line?
4. The Fit Equation is given below Fit Name and the parameters a, b and c are given to the right of the equation. What kinematics equation has a form similar to the Fit Equation shown?
5. What is the acceleration of the person?
6. If there were no friction, what would the acceleration of the person be? Note that the angle of the slide is 28.7° from the horizontal.
7. What is the net force on the person (mass of about 60kg)?
8. How do you know there is friction?
9. Is this static or kinetic friction?
10. What is the coefficient of friction between the person and the slide? (Include neat work showing your free body diagram, application of Newton's second Law and work done to solve for the coefficient of friction)
11. Is this a reasonable value? Why or why not?
12. Does this seem reasonable for all the sliders in the video? Please provide examples of people in the video to support your answer.