Web**Assign**

Lab #11: Collision: Rutherford Scattering (Homework)

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PHYS 172-SPRING 2012, Spring 2012
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Current Score : 3 / 3   **Due :** Thursday, April 5 2012 11:59 PM EDT

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1. 1.5/1.5 points | [Previous Answers](#)

For the system of the gold atom and alpha particle select the following that remained constant throughout the collision.

- ☐ The position of the gold atom.
- ☑ The x-component of the momentum of the system.
- ☑ The total energy of the system.
- ☐ The kinetic energy of the system.
- ☐ The force between the alpha particle and the gold atom.
- ☑ The y-component of the momentum of the system.
- ☑ The total momentum of the system.

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2. 1.5/1.5 points | [Previous Answers](#)

2. If the initial energy of the alpha particle was much larger so that the initial velocity was 0.99*c* how would you model the collision? The momentum update equation would be unchanged but for the position update you need to obtain the velocity of the alpha particle from the updated momentum.

In the nonrelativistic case,

alpha.v=alpha.p/alpha.m

Choose the correct code that finds the alpha.v for the relativistic case. (c is the speed of light)

- ○ **alpha.v=alpha.p/alpha.m/sqrt(1+(mag(alpha.p)/c)**2)**
- ● **alpha.v=alpha.p/alpha.m/sqrt(1+(mag(alpha.p)/alpha.m/c)**2)**
- ○ **alpha.v=alpha.p/alpha.m**
- ○ **alpha.v=alpha.p/alpha.m/sqrt(1+(mag(alpha.v)/alpha.m/c)**2)**
- ○ **alpha.v=alpha.p/alpha.m/sqrt(1+(mag(alpha.v)/c)**2)**

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