

Lab 4: Collisions

1 Assignment

For this lab, you will be analyzing collisions between pucks occurring at a number of different angles. You should conduct at least 8 different collision trials: one at 180° (i.e., a 'head on' collision), one at 90° , 3 other angles between 0° and 90° , and three other angles from 90° to 180° . When analyzing your collision data, you should calculate the actual collision angle from the data.

Your team is tasked with:

1. calculating the momentum before and after each collision and checking that momentum is conserved in these collisions
2. calculating the kinetic energy before and after each collision to determine the elasticity of the collision

2 Deliverables

For your lab report, 10% of the grade will be for following the guidelines in the lab report template. Another 10% will be allocated for the Abstract and Introduction of your report. The remaining percentage will be based on your inclusion of:

1. [12.5%] a discussion of how your team calculated collision angles from the collected data
- for assignment 1:
 2. [7.5%] a plot showing the x direction momentum before and after each collision as a function of collision angle
 3. [7.5%] a plot showing the ratio of the x direction momentum before and after each collision as a function of collision angle
 4. [7.5%] a plot showing the y direction momentum before and after each collision as a function of collision angle
 5. [7.5%] a plot showing the ratio of the y direction momentum before and after each collision as a function of collision angle
 6. [10%] a discussion of whether or not the momentum in the collisions was conserved, based on your plots
 - for assignment 2:
 7. [15%] a plot showing the total kinetic energy before and after each collision, as a function of collision angle
 8. [12.5%] a discussion of whether or not the collisions were elastic, based on your plot