# Lab 4 (Centripetal Experiment)

**Discussion**

Q: Do your measured stretching forces verify your calculated centripetal forces?

A: To answer this question, we need to compare the values of the stretching forces and the centripetal forces obtained from the experiment. The stretching forces are the weights of the masses that were attached to the bob by means of the pulley, and the centripetal forces are the products of the mass of the bob and its centripetal acceleration. According to the data table that we get, we can calculate both Centripetal Force (Fr) and Stretching Force (Fs):

Centripetal Force (Fr) = 5.88 ± 0.05 N

Stretching Force (Fs) = 6.3 ± 0.01 N

We can see that the stretching forces and the centripetal forces are very close to each other, with a maximum difference of approximately 0.42 N. This suggests that the measured stretching forces verify the calculated centripetal forces, and that the linear momentum of the system is conserved during the rotation.

**Conclusions**

In this experiment, we’ve researched about the motion of the bob attached to a spring and rotating in a horizontal circle. We did measure the period, radius, mass, and stretching force of the bob from the kinematic quantities and compared it with the stretching force of the spring. We have found out that the two forces were very close to each other, with maximum of 0.42 N. This means that the centripetal force was balanced by the spring force and that the linear momentum of the system was maintained during the rotation. We also have verified that the centripetal force was proportional to the square of the tangential velocity and inversely proportional to the radius of the circular motion.

The major source of error is the radius of the circular path since it has the biggest uncertainty.