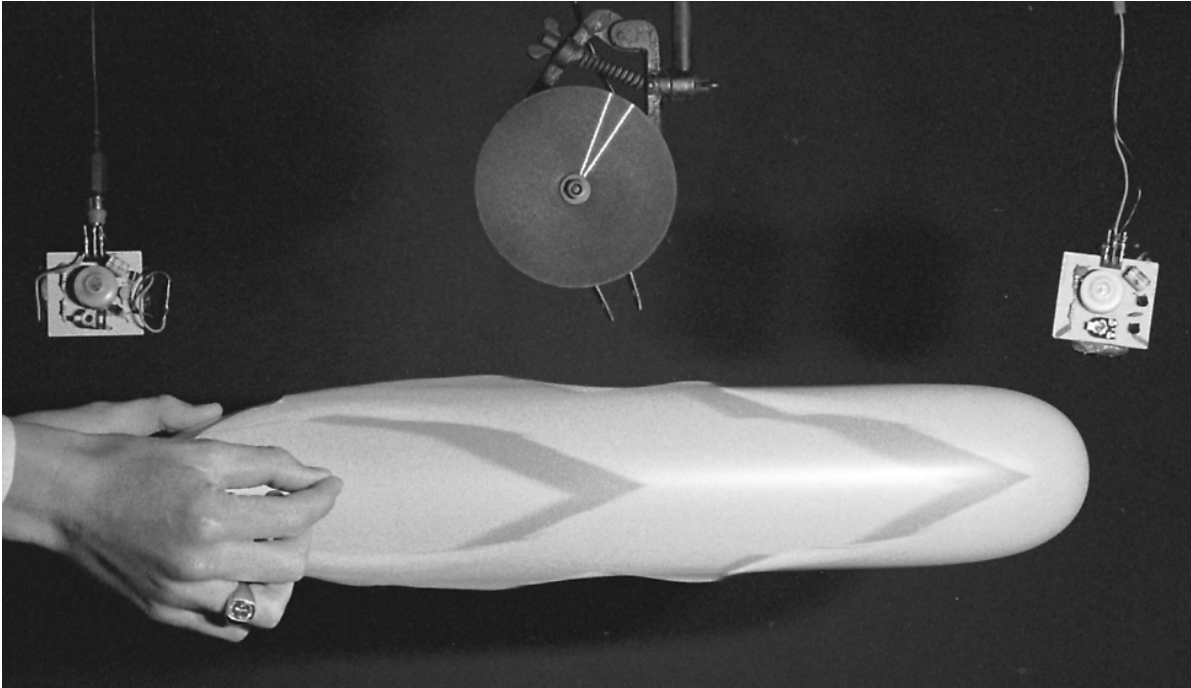


High-Speed Measurement: Speed of a Balloon Rip

Show your work for this problem. When making calculations using measurements, start with equations in symbolic form. Then show your substitutions with units. Express results to the proper number of significant figures.

The figure below shows a double-exposure of a balloon rip taken according to the method of Activity 17. The frequency of the clock was 51.7 ± 0.1 Hz, and the diameter of the disc was 0.105 ± 0.005 m.



- Measure the angle swept out by the clock hand (include uncertainty estimate) and calculate the time interval between the flashes of light.

Angle = \pm

- b. Measure the diameter of the clock disc on the photograph (include uncertainty estimate) and calculate a scale factor to be used in converting distances measured on the photograph to actual size.

Diameter of disc in photo = \pm

- c. Measure the distance between the two images of the rip vertex (include uncertainty estimate). Then use the scale factor to convert to actual size.

Distance traveled by rip vertex in photo = \pm

- d. Calculate the speed of the rip.

- e. Determine the uncertainties in the calculated speed using the methods shown in class. There will be uncertainties for 5 individual measurements. Show your work as in the example done in class.