

Answer on Question #41739, Physics, Other

A student repeatedly measured the length of a simple pendulum and recorded the results in centimetre as: 36.9, 36.7, 36.8 and 36.6. What is the precision index of this measurement in cm?

- 0.108
- 36.75
- 0.054
- 0.0269

Solution:

	Reading	Deviation
1	36.9	+0.15
2	36.7	-0.05
3	36.8	+0.05
4	36.6	-0.15
Mean value	36.75	±0.1

The repeated measurement of the same quantity yield results with better precision. A measure of this is the precision index S whose definition is

$$S = \frac{\bar{d}}{\sqrt{n}}$$

where \bar{d} is the average deviation and n is the number of observations. The precision index S is a measure of uncertainty of average. Using the data of Table, the precision index is

$$S = \frac{0.1}{\sqrt{4}} = 0.05$$

Answer. 0.054