Measuring frequency of tuning fork via Melde's experiment

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Measurements & Calculations

The length of the string taken was $L = 4.0$ m, with linear-density $\mu = 3.2 \times 10^{-3}$ kg m^{-1}. A frequency of 125 Hz was input. Tension was varied by varying the load in the container.

The values measured were as follows

Tension (T)	Number of half-cycles (N)	$\lambda = 2L/N$	Speed (v)	Frequency (f)
16.33	14	0.57	71.45	125.01
18.93	13	0.61	76.91	124.98
26.44	11	0.73	90.90	124.98
50.00	8	1.00	125.0	125.00
65.30	7	1.14	142.85	124.99
88.75	6	1.33	166.54	124.90

Table 1: Observed number of half-λ for a given T and corresponding estimates vof Frequency

where the speed was calculated using

$$v = \sqrt{\frac{T}{\mu}}$$

and the frequency as

$$f = \frac{v}{\lambda}$$

Results

The average of the measured frequency was $f = 124.98$ Hz, which has a deviation of 0.02 Hz from the true value (125 Hz).