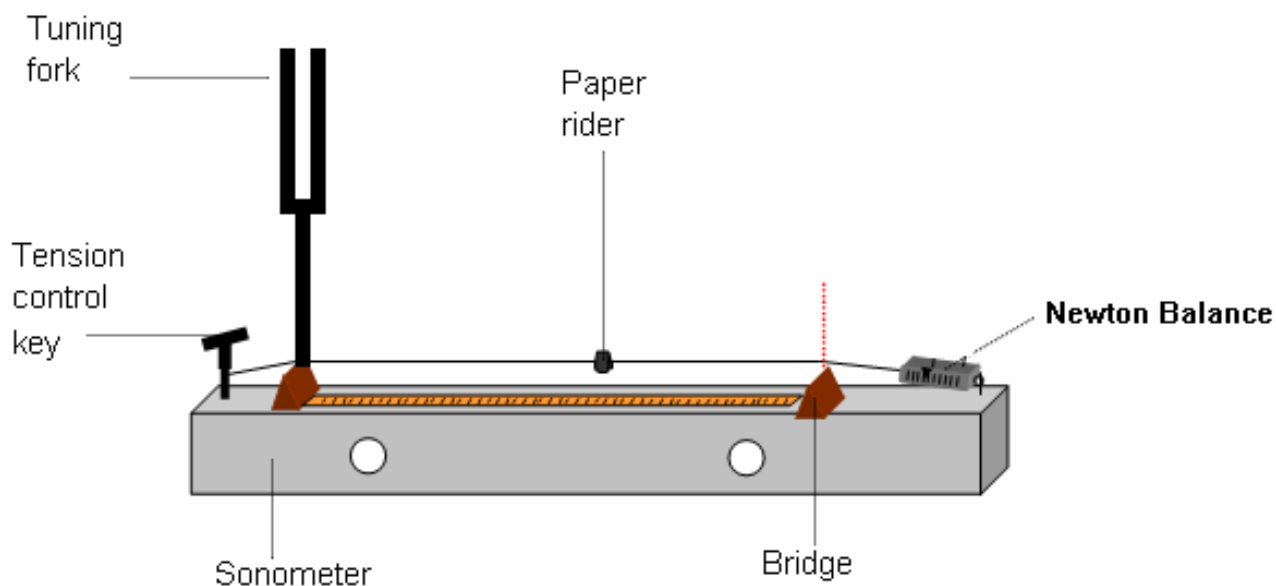


INVESTIGATION OF THE VARIATION OF FUNDAMENTAL FREQUENCY OF A STRETCHED STRING WITH TENSION

Apparatus

Tuning forks, sonometer, calculator, newton balance, paper.

Safety note: Wear safety goggles in case the sonometer wire snaps.



Procedure

1. Set up the apparatus as in diagram.
2. Set the bridges at a fixed distance from each other – this must remain constant during the course of the experiment.
3. Strike the 256 Hz tuning fork and hold it against the wire at the top of one of the bridges.
4. Vary the tension of the wire by adjusting the tension control key.
5. When the resonant length of the wire is reached, the paper rider will shake off the wire.
6. Read the value of the tension off the PC or calculator attached to the force sensor.
7. Record the tuning fork frequency and the tension of the wire in the table.
8. Repeat steps 3 – 7 for every tuning fork.
9. Plot a graph of frequency f against \sqrt{T} .

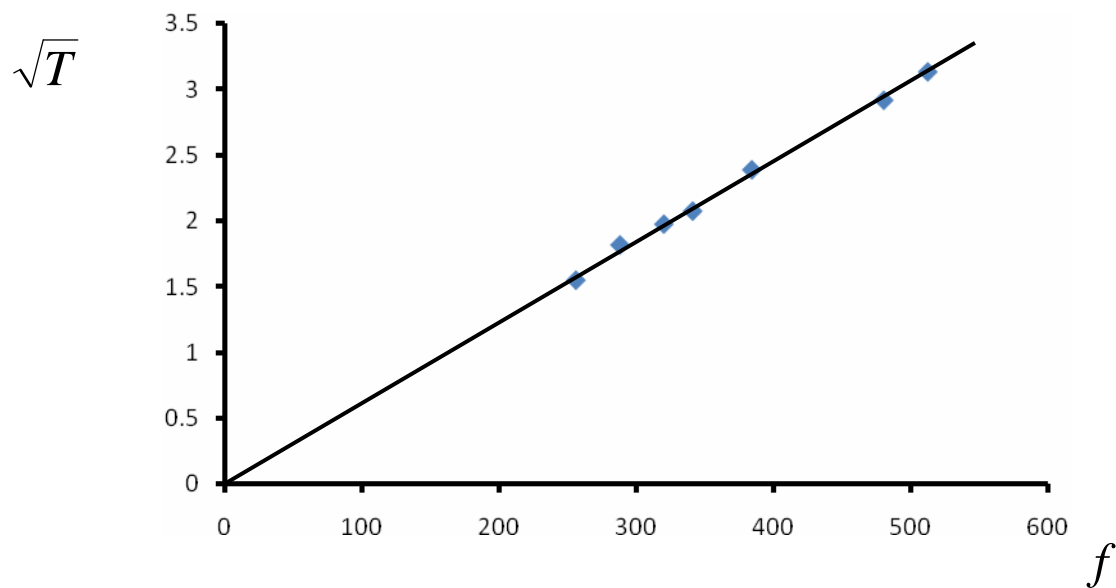
Note

A short length of drinking straw can also be used as a very light rider. Slit the straw lengthwise first; cut off a 0.2 cm piece and slip it onto the string.

Results

f/Hz	T/m	\sqrt{T}/m^{-1}
256	2.4	1.55
288	3.3	1.82
320	3.9	1.97
341	4.3	2.07
384	5.7	2.39
480	8.5	2.92
512	9.8	3.13

Graph



Conclusion

A straight line through the origin will verify that frequency $f \propto \sqrt{T}$.