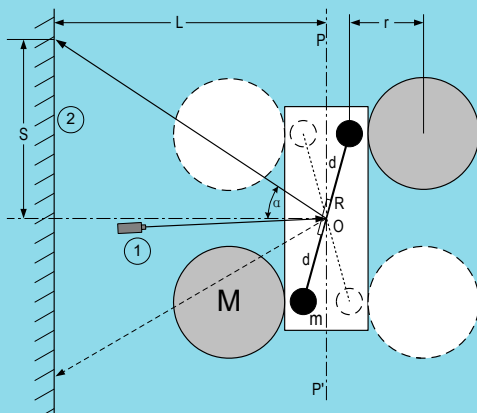
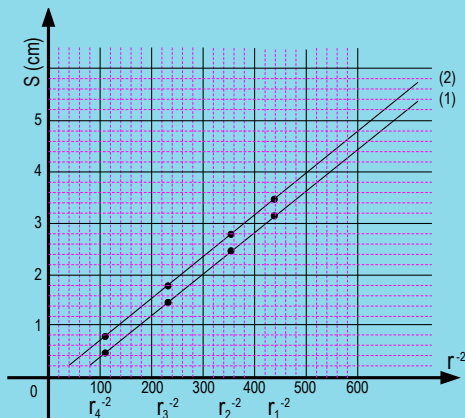


LEMI-47 Cavendish Balance for Measuring Gravitational Constant

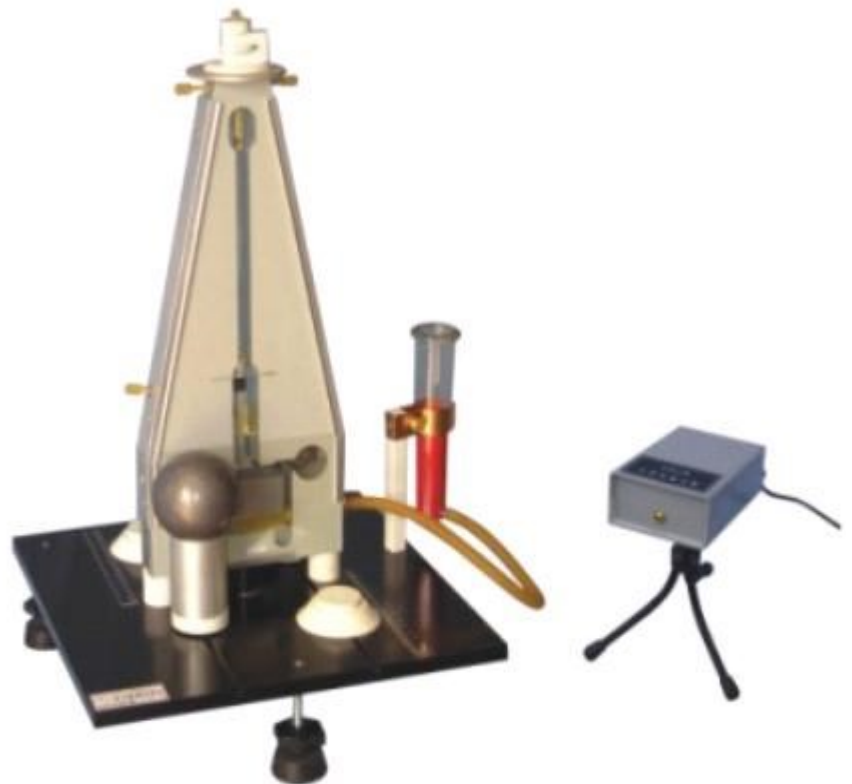
- Clear physics concept
- Compact, stable & reliable
- Affordable



Principle of final shift method



Coordinate diagram of square inverse ratio



LEMI-47 is a compact experimental instrument for measuring the gravitational constant and verifying the gravitational effect based on an elaborately designed Cavendish balance (torsion pendulum). It uses a reflected laser beam to monitor the damped harmonic oscillations of the balance with the two large spherical masses in both positions. From the period of the oscillation, the position of the equilibria, and the geometry and masses involved, the instrument can be used to qualitatively observe the phenomenon of universal gravitation between objects and to quantitatively measure the gravitational constant.

Experimental Contents

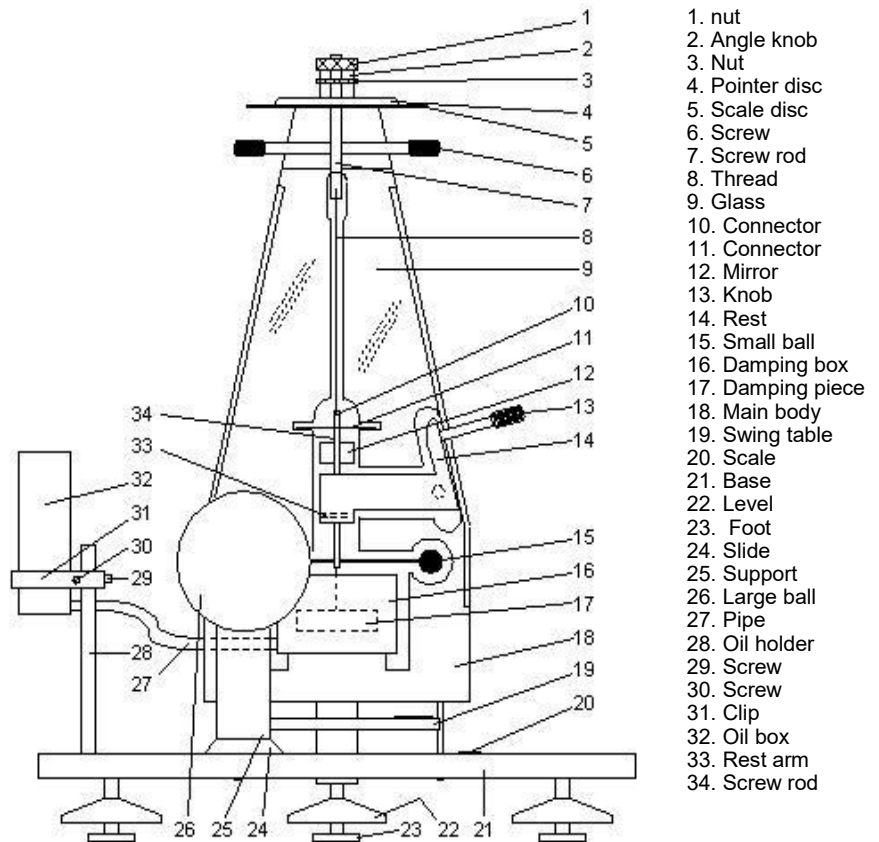
1. Measure the inherent oscillating cycle of a torsion balance.
2. Measure gravitational constant with two methods: final deflection method & acceleration method.
3. Verify gravitational force between two objects is inversely proportional to square of their distance.

Specifications

Mass of lead balls	2 large balls: 1.5 kg /ea, mass difference between the two balls < 2.0 g
	2 small balls: 20 g each, mass difference between the two balls < 0.5 g
Beam of torsion balance	Length: 100 mm
Thread of torsion balance	Free torsion oscillating cycle: 0.05 s, length: 150 mm, area: $0.145 \times 0.008 \text{ mm}^2$
Damping type	Oil
Uncertainty	Measurement error of gravitational constant: < 15%

Part List

Large lead ball	2
Magnetic bar	1
Supporter pipe	2
Slide	2
Leveling screw	3
Thread	5
Damping oil cylinder	1
Holder of cylinder	1
Screw for holder	1
Clamp	1
Screw for clamp	1
Nut for clamp	1
Oil bottle (damping oil)	1
Plastic pipe for oil	1



Schematic of system