Answer on Question #59464-Physics – Mechanics | Relativity

If an oscillatory motion must be simple harmonic, the restoring force F must obey ------------------ law for small displacements from equilibrium position

Answer

If an object exhibits simple harmonic motion, a force must be acting on the object. The force is

$$F \; = \; ma \; = \; -m\omega^2 x.$$

It obeys Hooke's law, $F \; = \; -kx$, with $k \; = \; m\omega^2$.

If an oscillatory motion must be simple harmonic, the restoring force F must obey **Hooke's** law for small displacements from equilibrium position.