

Standing Longitudinal Waves on a Spring



Purpose: To demonstrate standing longitudinal waves on a spring.

Locations: Room 146; shelf N5(mech. vibrator, spring & strobe); function generator/BNC-Banana adapter on G4 & G5; banana cords on ends of cabinets A & H; 1.3m rod in bins, cross-rod on G2, clamp on I3, tape on A3.

The function generator (sine wave mode, max. amplitude) can be adjusted to drive the mechanical vibrator at resonant frequencies. Use the (banana plug) adapter with the hole for the vibrator to hold the spring. Be sure to tape the spring to the top of the horizontal rod to prevent it from vibrating or sliding off. The spring shown is stretched to 52 cm (do not exceed) and the function generator is at 22 Hz. Standing waves should occur when there is an integer number of half wavelengths along the spring. For an added visual effect, use a strobe slightly off resonant frequency to show slower motion of the anti-nodes.