

Seismic Waves

December 9, 2014

{ 1 }

Earthquakes' Vibrations

- When the crust shifts, energy is released.
- The energy radiates in all directions through vibrations.

The diagram shows a cross-section of the Earth's crust and upper mantle. A purple dot represents the focus, with a red dot above it representing the epicenter. Red concentric circles radiate from the focus, representing seismic waves. Labels include 'crust', 'mantle', 'focus', 'epicenter', 'surface waves', and 'body waves'.

{ 2 }

Measuring Earthquakes

- Magnitude (Richter Scale)
 - Seismographs are the most reliable measures of earthquakes.
 - Each increase in one unit of magnitude means a ten-fold increase in shaking.
- Intensity (Mercalli Scale)
 - Based upon the reports of people who experienced the earthquake and observed the destruction.

The diagram shows a seismograph with a vertical frame. A heavy mass is suspended from the top. A pen is attached to the mass and is in contact with a piece of paper that can move horizontally. An arrow indicates the direction of ground motion. Labels include 'Heavy Mass (resists motion)', 'Paper (moves in direction of arrow)', and 'Pen'. Below the diagram, it says 'Earth Motion due to Earthquake'.

{ 3 }

MODIFIED MERCALLI SCALE		RICHTER SCALE	
I. Felt by almost no one.		2.5	Generally not felt, but recorded on seismometers.
II. Tremor noticed by many, but they often do not realize it is an earthquake.		3.5	Felt by many people.
IV. Felt indoors by many. Feels like a truck has struck the building.			
V. Felt by nearly everyone; many people awakened. Swaying trees and poles may be observed.			
VI. Felt by all; many people run outdoors. Furniture moved, slight damage occurs.	4.5		Some local damage may occur.
VII. Everyone runs outdoors. Poorly built structures considerably damaged; slight damage elsewhere.			
VIII. Specially designed structures damaged slightly, others collapse.		6.0	A destructive earthquake.
IX. All buildings considerably damaged, many shift off foundations. Noticeable cracks in ground.			
X. Many structures destroyed. Ground is badly cracked.		7.0	A major earthquake.
XI. Almost all structures fall. Very wide cracks in ground.			
XII. Total destruction. Waves seen on ground surfaces, objects are tumbled and tossed.		8.0 and up	Great earthquakes.

{ 4 }

Which Earthquake Research Center is closest to the epicenter?

Large Tremor felt quickly

The figure shows four seismograph traces labeled Station A, Station B, Station C, and Station D. The x-axis is labeled 'seconds' and ranges from 10 to 80. Station A shows a very large and sharp initial peak, indicating it is the closest to the epicenter. Station B shows a smaller peak, Station C shows an even smaller peak, and Station D shows a very small peak. A red circle highlights Station A.

{ 5 }

Seismic Waves - Lab

- This lab will be collected and graded, so please do your best!
- Materials for the lab are on the front table
- Work on the lab independently or with one partner of your choice. If you are working with a partner, please sit at the same desk

Tonight's Homework:

Finish your Seismic Waves Lab!

{ 6 }