

# Reflection seismic 1 script

## **Educational Material**

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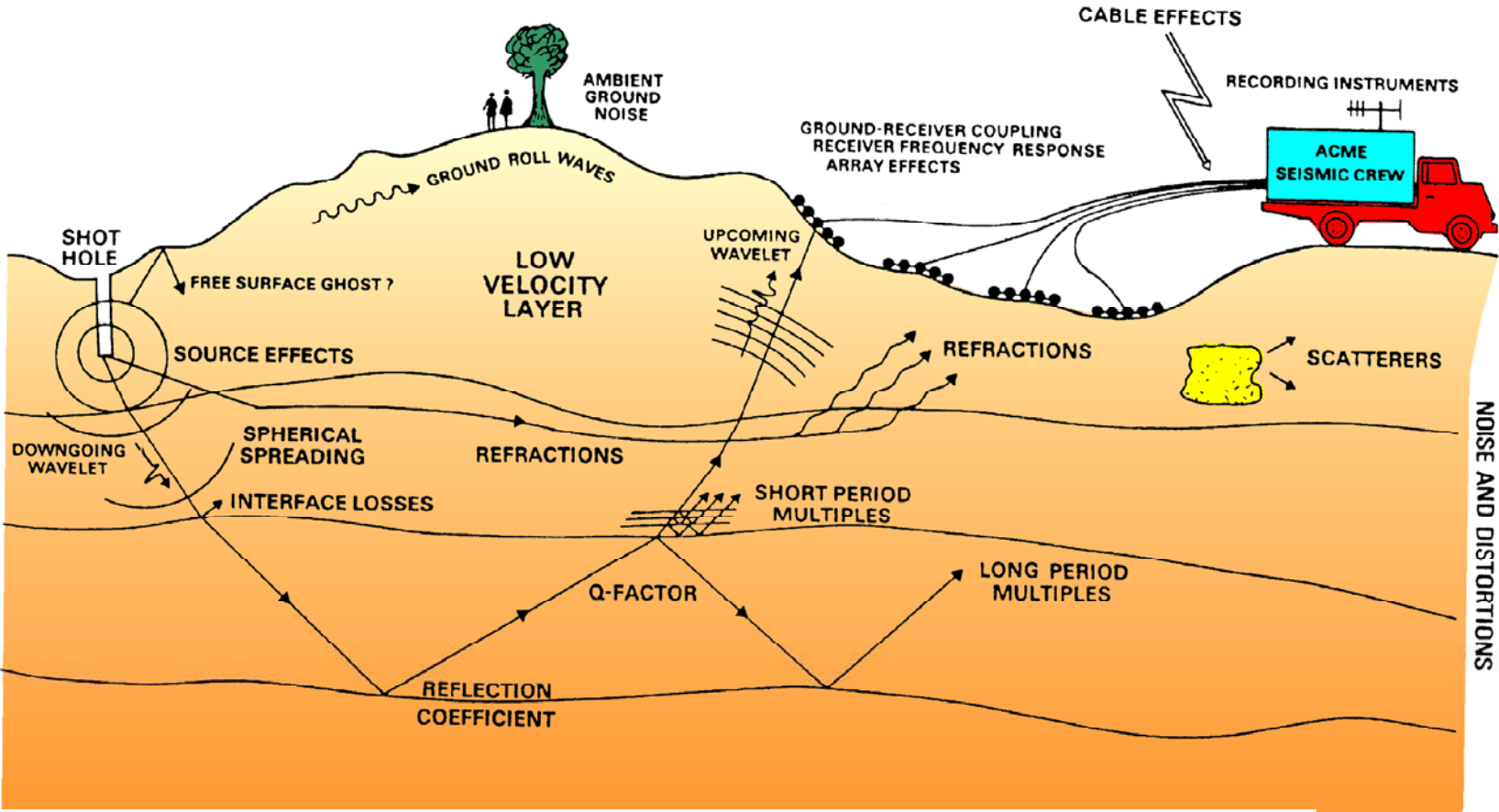
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# Processes affecting seismic amplitudes



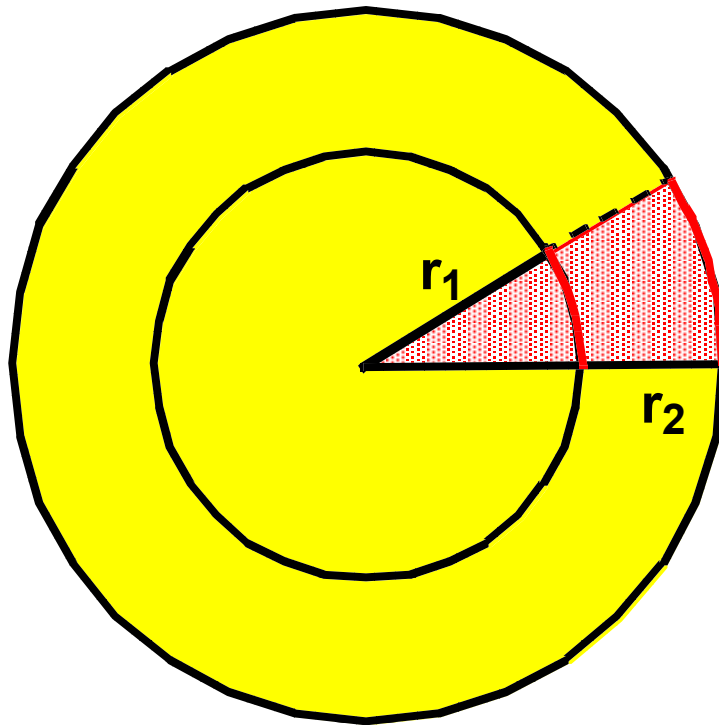
(Reynolds, 1998)

# Seismic amplitudes

Affected by

- Reflection and transmission at an interface
- Geometrical spreading
- Absorption
- Receiver response
- Measurement system

## Geometrical spreading



Energy proportional to:

**Plane wave:**            **constant**

**Cylindrical wave:**     **$\sim 1/r$**

**Spherical wave:**         **$\sim 1/r^2$**

Energy is proportional to  $(\text{Amplitude})^2$

# Absorption

## Transformation of Energy into Heat

Amplitude:  $A = A_0 e^{-\alpha x}$   $\alpha = \text{Absorption coefficient}$

Energy is proportional with  $A^2$

## Quality factor

$$Q = \frac{2\pi}{\Delta E / E} = 2\pi \frac{E}{\Delta E} = \frac{2\pi}{\text{Part of energy, that is lost in a cycle}}$$

## Relation between Q and $\alpha$

$$\frac{1}{Q} = \frac{\alpha v}{\pi f} = \frac{\alpha \lambda}{\pi}$$

# Absorption is frequency dependent

