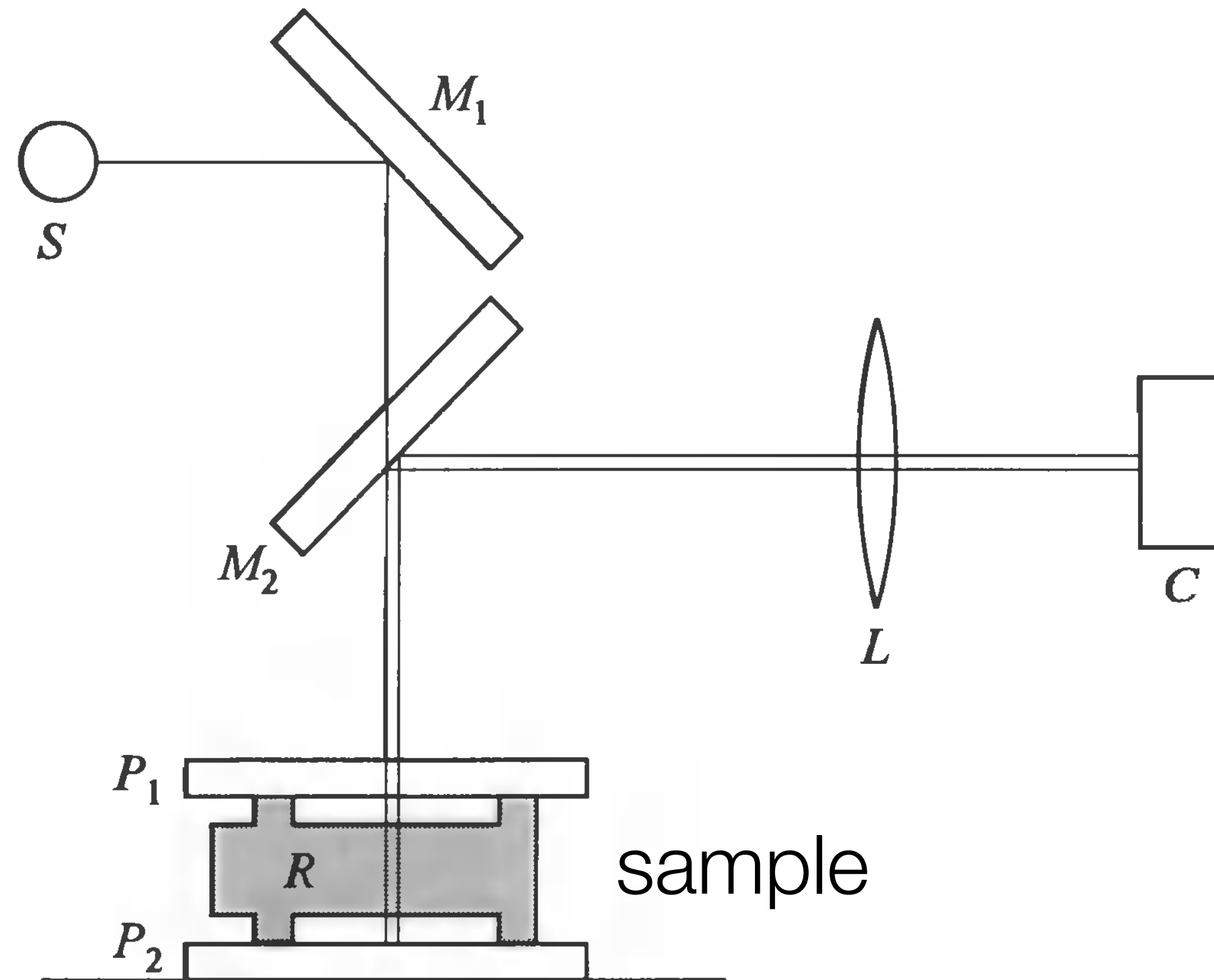# Measuring the change in volume with temperature, β_p , in solids
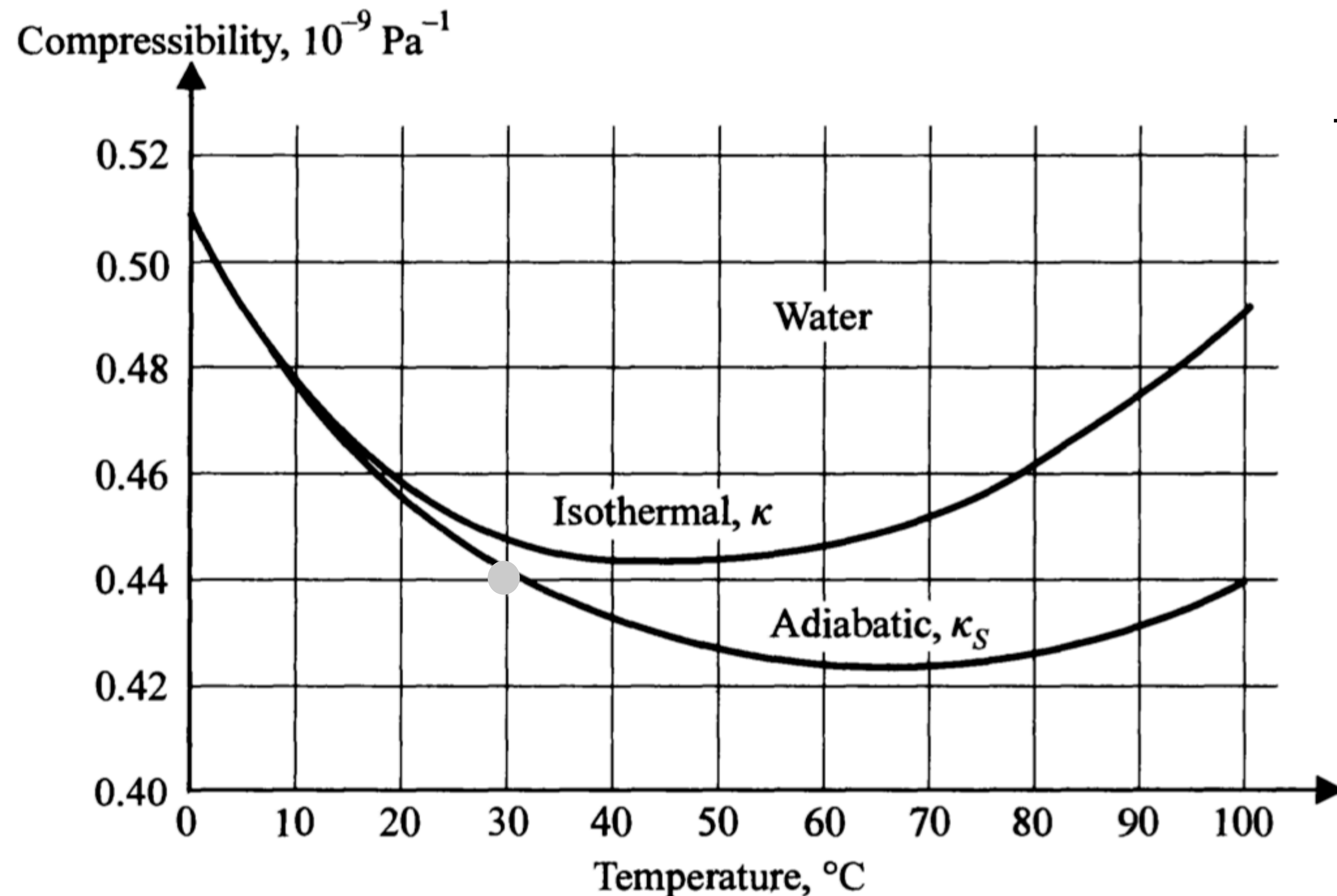

$$\beta_p = \frac{1}{V}\left(\frac{\partial V}{\partial T}\right)_p$$

As the system expands can measure how the interference pattern changes

Isothermal Compressibility of Water and Sound Speed

The speed of sound is related to these curves

$$c_s = \sqrt{\frac{B_s}{\rho}} = \sqrt{\frac{1}{\rho \kappa_S}}$$

For water $\rho = 1 \, \text{g/cm}^3$ and

$$c_s \simeq 1500 \, \text{m/s}$$

at 30 degrees celsius