Risonanza di ciclotrone

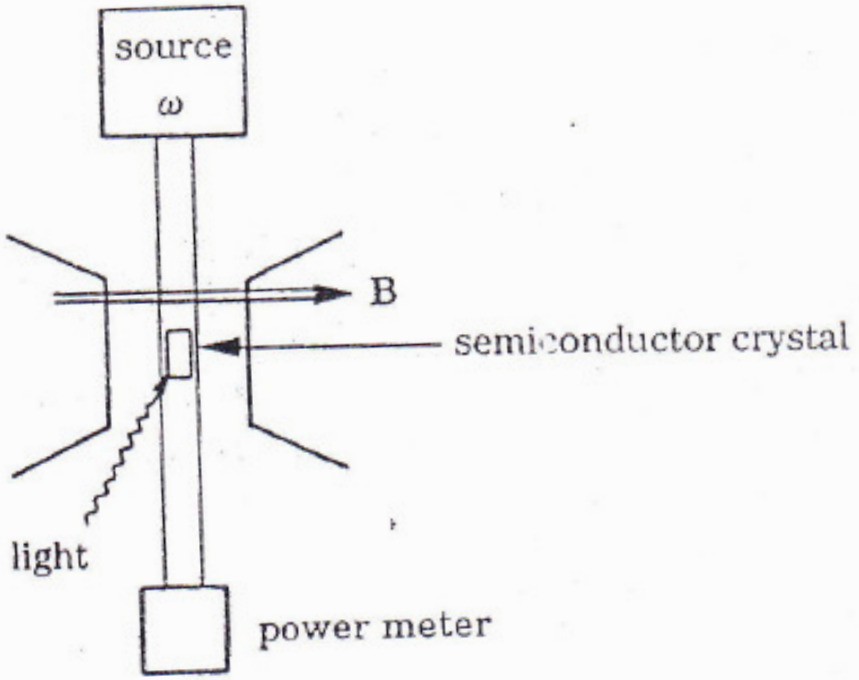


Fig. 3.9. Schematic view of a cyclotron resonance experiment.

Geometria dell'esperimento

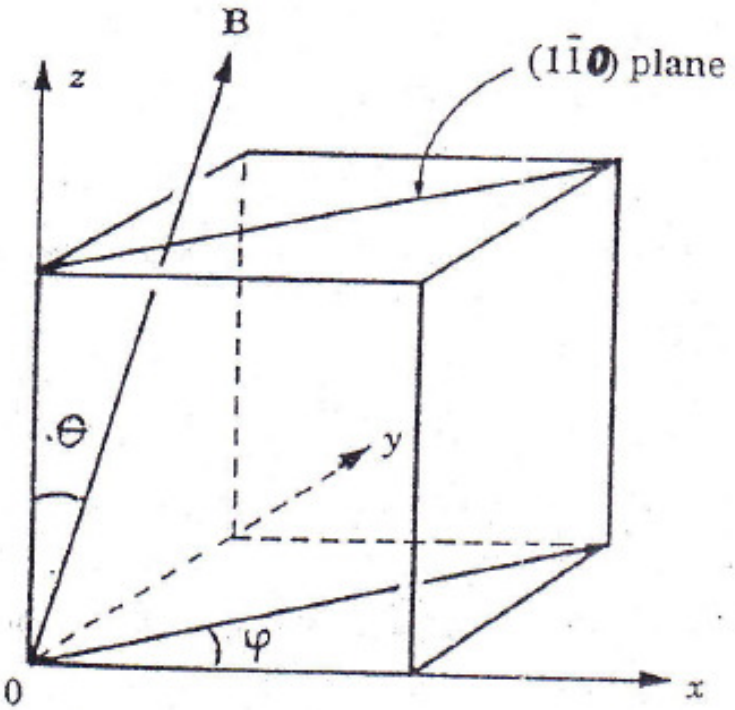


Fig. 3.10. Orientation of the magnetic field B the crystal axes of Si.

Spettro

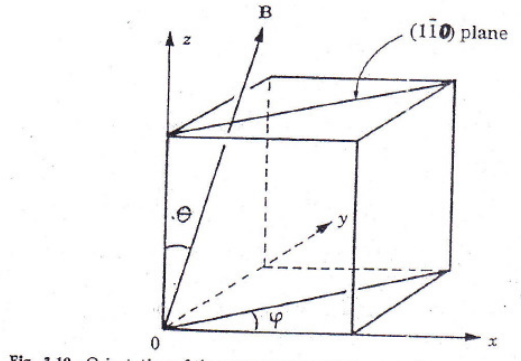


Fig. 3.10. Orientation of the magnetic field B the crystal axes of Si.

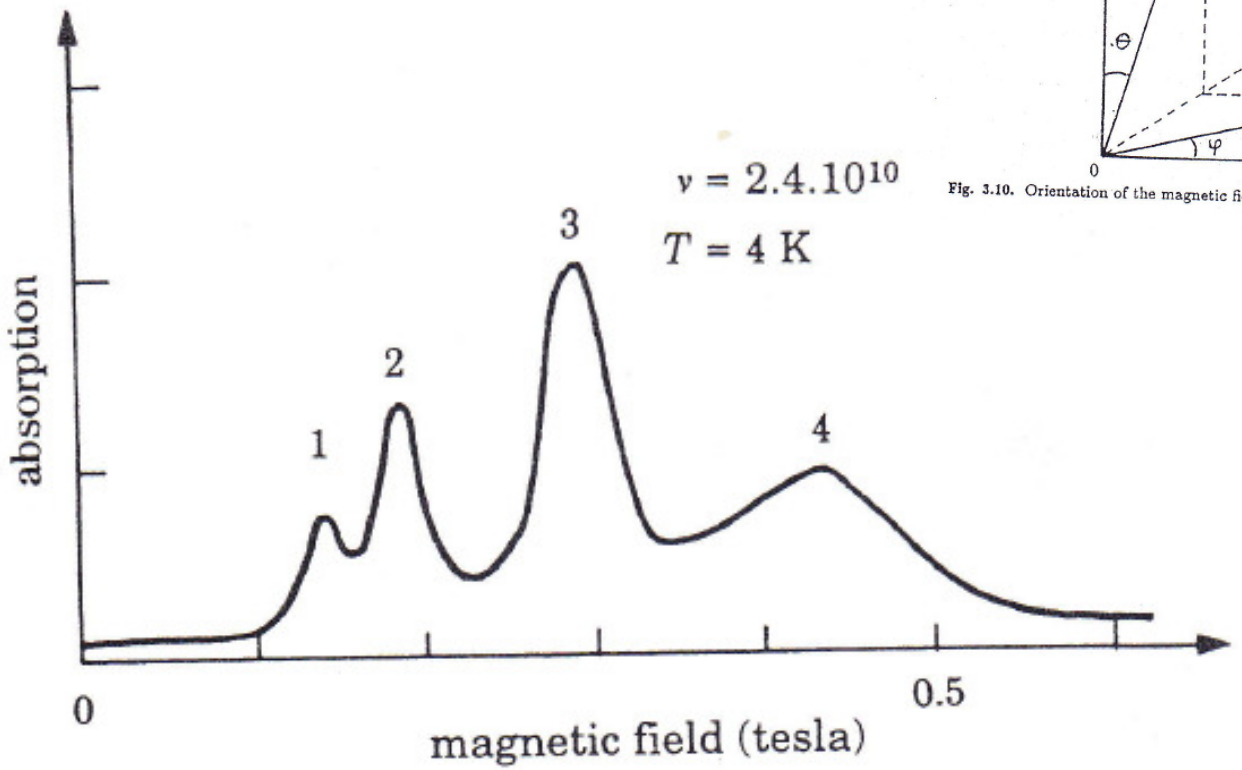
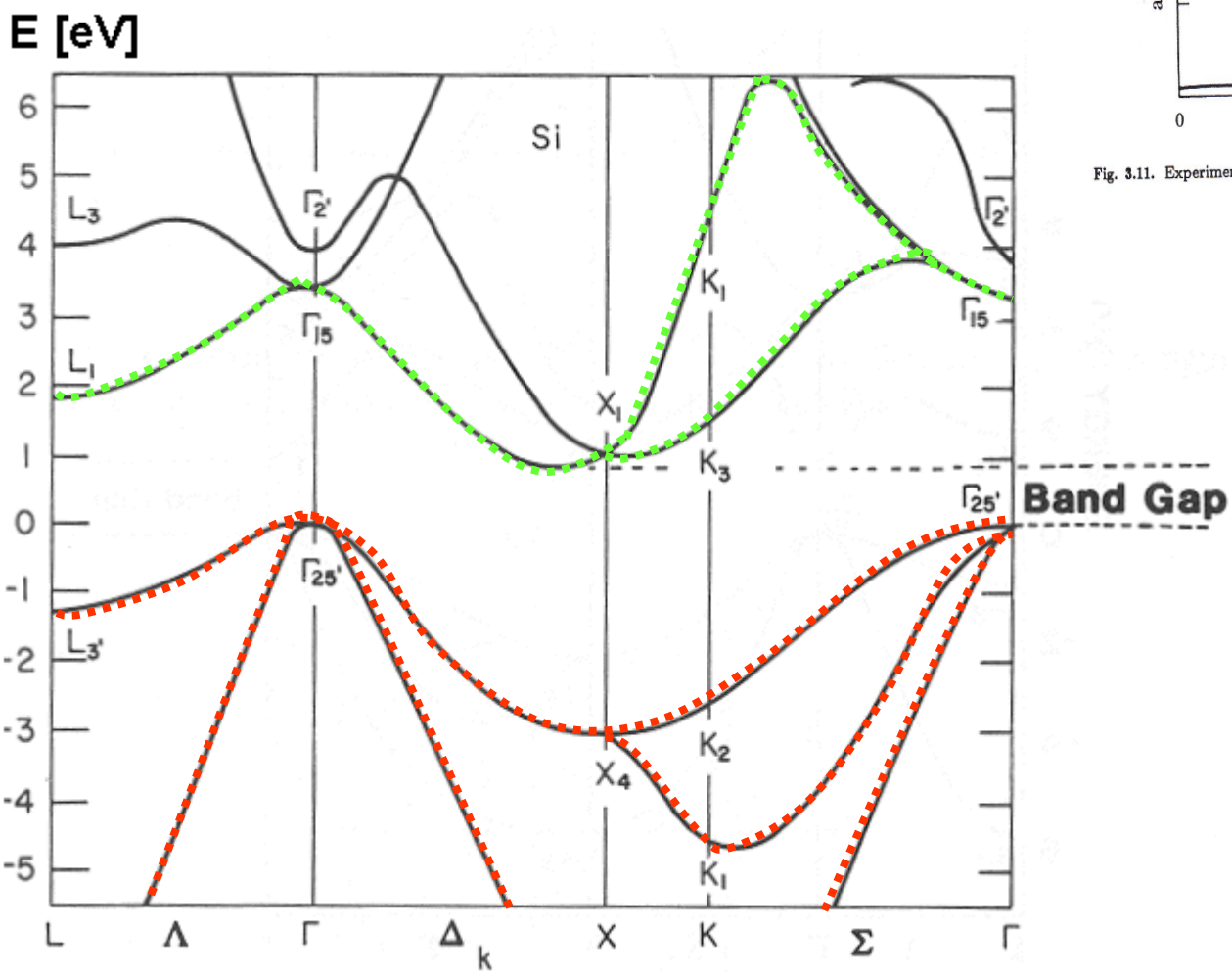


Fig. 3.11. Experimentally measured absorption.

$$B_o = \left[\frac{m_o \omega_c}{e} \right] = 0.86T$$

Bande del Silicio



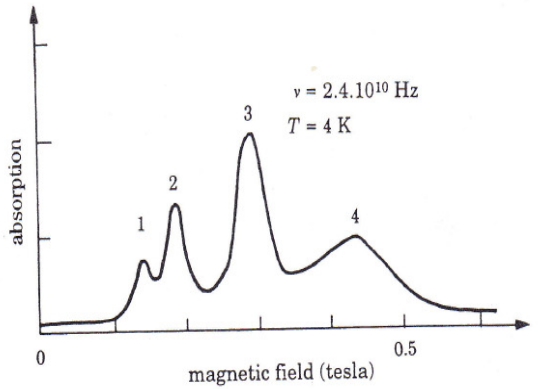


Fig. 3.11. Experimentally measured absorption.

Soluzioni con anisotropia

$$\omega^2 = \left[\frac{(eB)^2}{m_T}\right]\left(\frac{\sin\theta^2}{m_L} + \frac{\cos\theta^2}{m_T}\right) \equiv \left[\frac{eB}{m(\theta)}\right]^2$$

$$\left(\frac{1}{m(\theta)}\right)^2 = \left(\frac{\sin\theta^2}{m_T m_L} + \frac{\cos\theta^2}{{m_T}^2}\right)$$

Dipende da θ e non da ϕ

Variando direzione di B

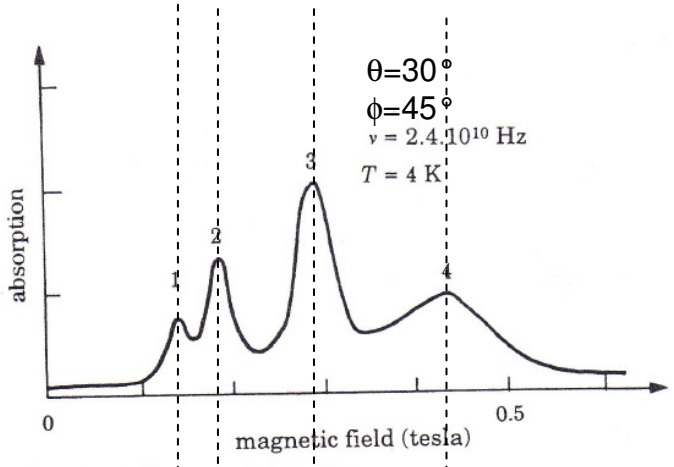


Fig. 3.11. Experimentally measured absorption.

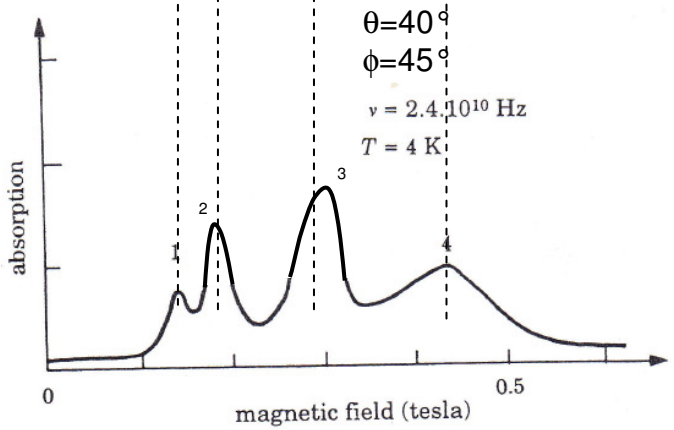


Fig. 3.11. Experimentally measured absorption.

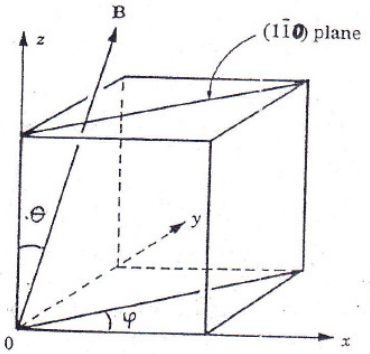
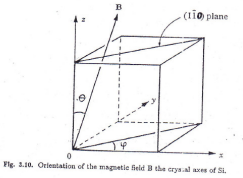


Fig. 3.10. Orientation of the magnetic field B the crystal axes of Si.

Variando direzione di B



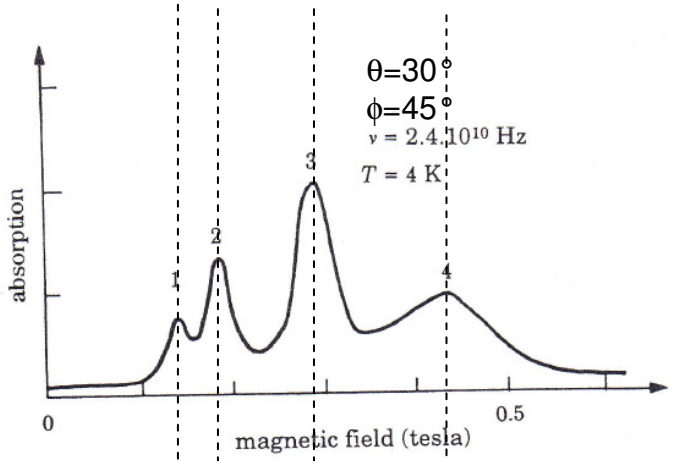


Fig. 3.11. Experimentally measured absorption.

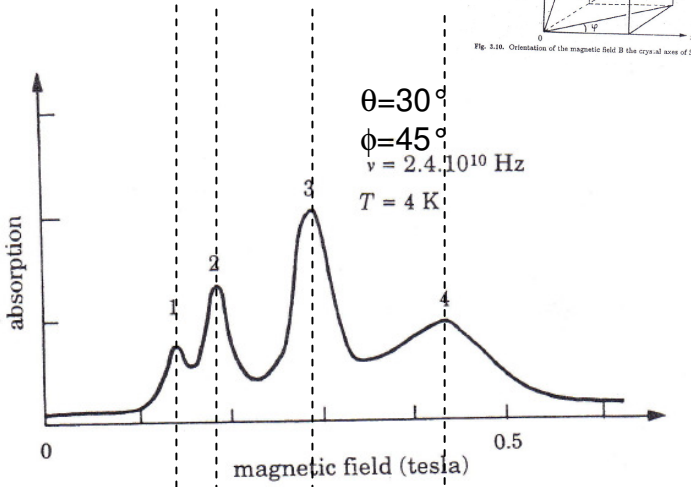


Fig. 3.11. Experimentally measured absorption.

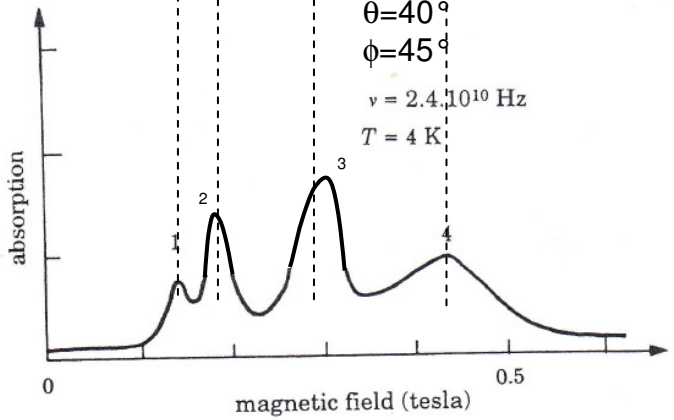


Fig. 3.11. Experimentally measured absorption.

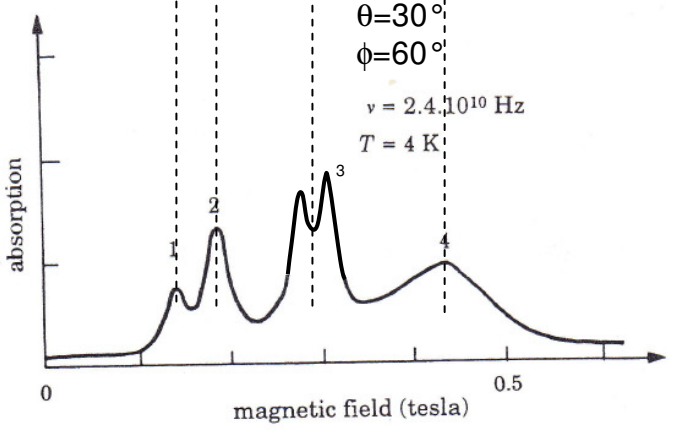


Fig. 3.11. Experimentally measured absorption.

Superfici equienergetiche in X

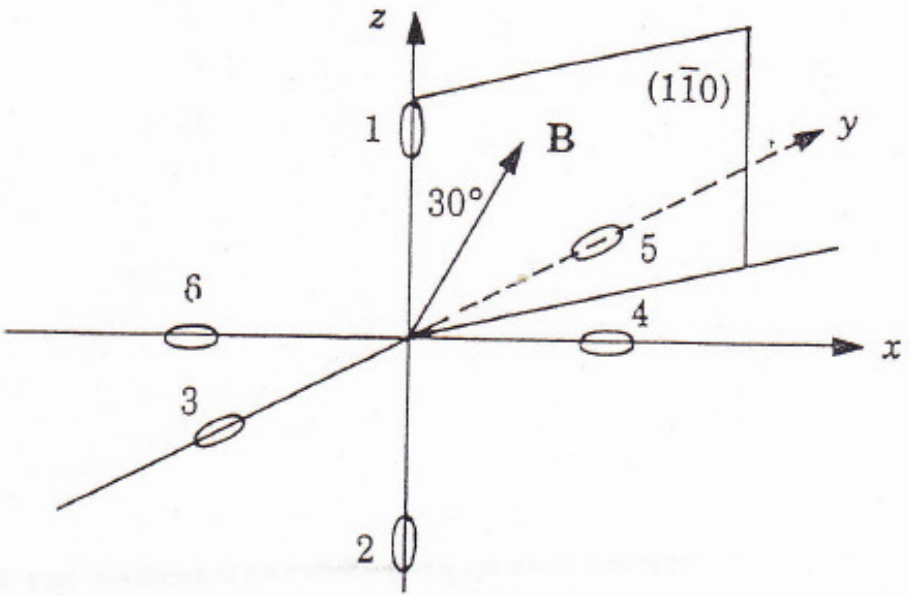


Fig. 3.12. Orientation of **B** relative to the ellipsoids of constant energy of the conduction band.

Definizione angoli

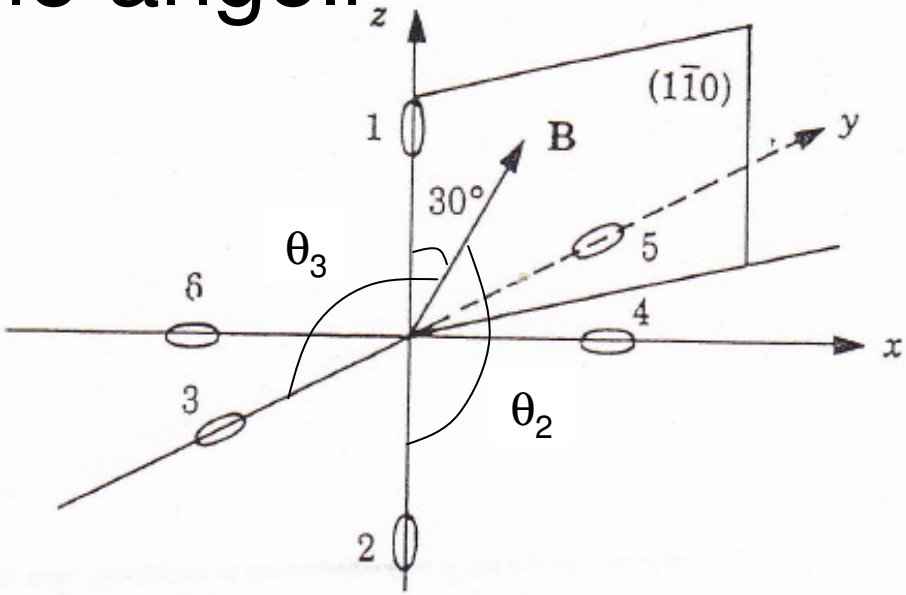


Fig. 3.12. Orientation of **B** relative to the ellipsoids of constant energy of the conduction band.

$$\omega_i^2 = \left[\frac{(eB)^2}{m_T}\right]\left(\frac{\sin\theta_i^2}{m_L} + \frac{\cos\theta_i^2}{m_T}\right)$$

$$\theta_1 = \theta \quad \theta_2 = \pi - \theta$$

$$\theta_4 = ar\cos(\sin\theta\cos\varphi) \quad \theta_6 = \pi - \theta_4$$

$$\theta_5 = ar\cos(\sin\theta\sin\varphi) \quad \theta_3 = \pi - \theta_5$$

Dati numerici

$$B_o = \left[\frac{m_o \omega_c}{e}\right] = 0.86T$$

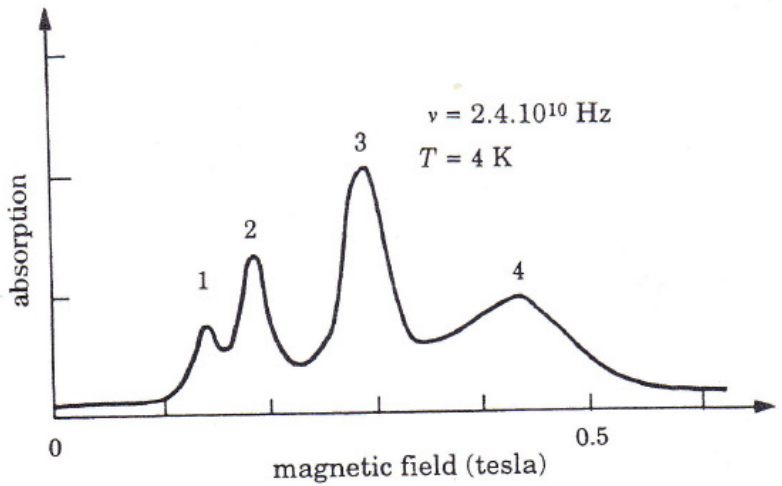


Fig. 3.11. Experimentally measured absorption.

$$B_1 = 0.13T \rightarrow m_1 = \frac{0.13}{0.86} m_o = 0.15 m_o$$

$$B_2 = 0.18T \rightarrow m_2 = \frac{0.18}{0.86} m_o = 0.21 m_o$$

$$B_3 = 0.29T \rightarrow m_3 = \frac{0.29}{0.86} m_o = 0.34 m_o$$

$$B_4 = 0.43T \rightarrow m_4 = \frac{0.43}{0.86} m_o = 0.5 m_o$$

Dati numerici

$$B_o = \left[\frac{m_o \omega_c}{e}\right] = 0.86T$$

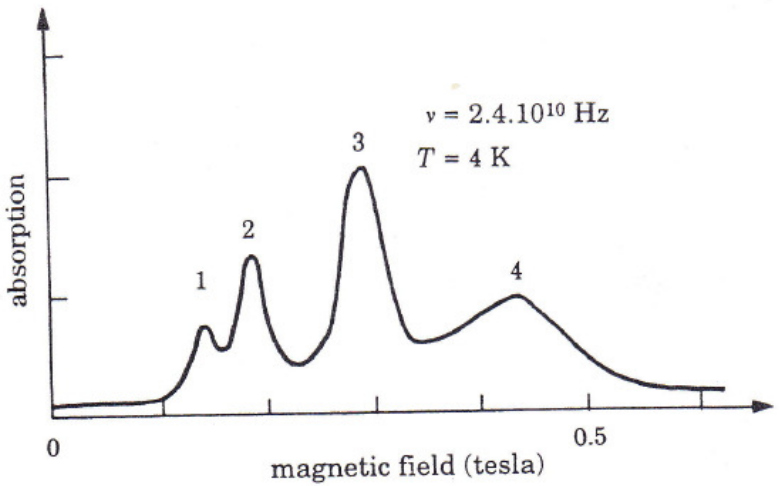


Fig. 3.11. Experimentally measured absorption.

$$B_1 = 0.13T \rightarrow m_1 = \frac{0.13}{0.86} m_o = 0.15 m_o = m_{lh}$$

$$B_2 = 0.18T \rightarrow m_2 = \frac{0.18}{0.86} m_o = 0.21 m_o = m_e(\theta = 30°) \begin{cases} m_T = 0.19 m_o \\ m_L = 0.9 m_o \end{cases}$$

$$B_3 = 0.29T \rightarrow m_3 = \frac{0.29}{0.86} m_o = 0.34 m_o = m_e(\theta = 60°)$$

$$B_4 = 0.43T \rightarrow m_4 = \frac{0.43}{0.86} m_o = 0.5 m_o = m_{hh}$$