E363 (2004C #2)

C2

$$E_{G.S.} = \frac{\pi^2}{2mL^2}(1^2+1^2) < V_0 \qquad (b)$$

(1) $\longrightarrow$ $$L_{min} = \frac{\pi}{\sqrt{mV_0}}$$

$$E_{\text{first Landau level}} = \frac{1}{2}\omega_B = \frac{eB}{2m} < V_0 \qquad (d)$$

$$B_{max} = \frac{1}{e}2mV_0$$

(2) מספר הרמות הנתון הינו

$$\frac{\pi^2}{2mL^2}(n_x^2+n_y^2) < V_0 \;,\; (0 < n_x, n_y)$$

(2) $\longrightarrow$ $$N_0 = \frac{1}{2\pi}mL^2V_0$$

$$g_{Landau} = \frac{1}{2\pi}eBL^2 = 2\cdot N_0 \qquad (3)$$

E364 (2005 C #2)

(3) $$B_2 = \frac{1}{3}B_1 = \frac{2}{3}\frac{mV_0}{e}$$

(4) $$N_2 = 2 * \frac{1}{3}N_1$$

$$\frac{N_2}{N_0} = \frac{4}{3}$$

$$\left[\frac{1}{2}+(n-1)\right]\omega = V_0$$

$$\frac{N_n}{N_0} = \frac{n\omega}{V_0} = \frac{n}{n-1/2}$$