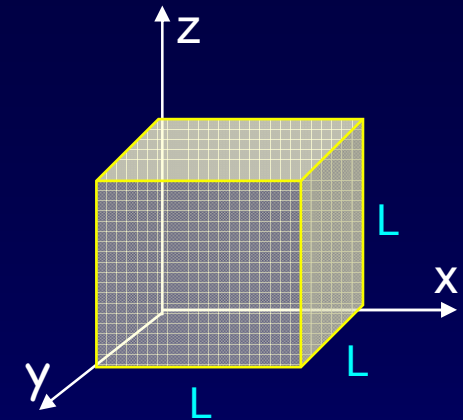


Solution

Consider a 3D cubic box:

Show energies and label (n_x, n_y, n_z) for the first 11 states of the particle in the 3D box, and write the degeneracy, D , for each allowed energy. Define $E_0 = h^2/8mL^2$.



E	(n_x, n_y, n_z)	Degeneracy
$12E_0$	$(2, 2, 2)$	$D=1$
$11E_0$	$(3, 1, 1)$ $(1, 3, 1)$ $(1, 1, 3)$	$D=3$
$9E_0$	$(2, 2, 1)$ $(2, 1, 2)$ $(1, 2, 2)$	$D=3$
$6E_0$	$(2, 1, 1)$ $(1, 2, 1)$ $(1, 1, 2)$	$D=3$
$3E_0$	$(1, 1, 1)$	$D=1$

$$E_{n_x n_y n_z} = \frac{h^2}{8mL^2} (n_x^2 + n_y^2 + n_z^2)$$

$$n_x, n_y, n_z = 1, 2, 3, \dots$$