Ko ta Hamiltonian deluje na lastne funkcije dobimo (za $n_x + n_y + n_z = 2$):

$$H|R\rangle|l m_l\rangle = \left(\hbar\omega \frac{7}{2} + m_l \mu_B B\right)|R\rangle|l m_l\rangle$$

Popravek pri lastnih energijah zaradi vključenega mag. polja je torej $m_l \mu_B B$ in je odvisen od m_l.

Sedaj iz lastnih funkcij 1D harmoničnega oscilatorja skonstruiramo lastne funkcija za 3D H.O. Lastne funkcije prvih treh stanj so

$$\psi_0 = \frac{1}{\sqrt[4]{\pi x_0^2}} e^{-\frac{x^2}{2x_0^2}} \qquad \psi_1 = \psi_0 \sqrt{2}\frac{x}{x_0} \qquad \psi_2 = \psi_0 \cdot \left(\sqrt{2}\left(\frac{x}{x_0}\right)^2 - \frac{1}{\sqrt{2}}\right)$$

Upoštevamo $x_0 = y_0 = z_0$ in sledi:

$$\psi_{110} = \psi_0(x)\sqrt{2}\frac{x}{x_0}\psi_0(y)\sqrt{2}\frac{y}{x_0}\psi_0(z)$$

V enačbo ustavimo sferične koordinate

$$|110\rangle = \psi_{110} = \frac{1}{(\pi x_0^2)^{3/4}} \exp\left(-\frac{r^2}{2x_0^2}\right)\frac{2}{x_0^2} r^2 \sin^2\vartheta \cos\varphi \sin\varphi$$

Enako lahko naredimo tudi z ostalimi kombinacijami in dobimo

$$|101\rangle = \psi_{101} = \frac{1}{(\pi x_0^2)^{3/4}} \exp\left(-\frac{r^2}{2x_0^2}\right)\frac{2}{x_0^2} r^2 \cos\vartheta \cos\varphi \sin\vartheta$$

$$|011\rangle = \psi_{011} = \frac{1}{(\pi x_0^2)^{3/4}} \exp\left(-\frac{r^2}{2x_0^2}\right)\frac{2}{x_0^2} r^2 \cos\vartheta \sin\varphi \sin\vartheta$$

$$|200\rangle = \psi_{200} = \frac{1}{(\pi x_0^2)^{3/4}} \exp\left(-\frac{r^2}{2x_0^2}\right)\left(\frac{2}{\sqrt{2}x_0^2} r^2 (\sin\vartheta\cos\varphi)^2 - \frac{1}{\sqrt{2}}\right)$$

$$|020\rangle = \psi_{020} = \frac{1}{(\pi x_0^2)^{3/4}} \exp\left(-\frac{r^2}{2x_0^2}\right)\left(\frac{2}{\sqrt{2}x_0^2} r^2 (\sin\varphi\sin\vartheta)^2 - \frac{1}{\sqrt{2}}\right)$$

$$|002\rangle = \psi_{002} = \frac{1}{(\pi x_0^2)^{3/4}} \exp\left(-\frac{r^2}{2x_0^2}\right)\left(\frac{2}{\sqrt{2}x_0^2} r^2 \cos^2\vartheta - \frac{1}{\sqrt{2}}\right)$$