ДОДАТОК. Хвильові функції електрона у кулонівському полі для $n = 1 \div 3$

Квантові числа			$\psi_{nlm_l}(r,\theta,\varphi) = R_{nl}(r) Y_{lm_l}(\theta,\varphi)$
n	l	m_l	
1	0	0	$\frac{1}{\sqrt{\pi}}\left(\frac{Z}{r_0}\right)^{3/2} \cdot \exp\left(-\frac{Z}{r_0} r\right)$
2	0	0	$\frac{1}{4\sqrt{2\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(2-\frac{Z}{r_0} r\right) \cdot \exp\left(-\frac{Z}{2r_0} r\right)$
2	1	0	$\frac{1}{4\sqrt{2\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(\frac{Z}{r_0} r\right) \cdot \exp\left(-\frac{Z}{2r_0} r\right) \cdot \cos\theta$
2	1	+1	$\frac{1}{8\sqrt{\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(\frac{Z}{r_0} r\right) \cdot \exp\left(-\frac{Z}{2r_0} r\right) \cdot \sin\theta \cdot \exp(i\varphi)$
2	1	-1	$\frac{1}{8\sqrt{\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(\frac{Z}{r_0} r\right) \cdot \exp\left(-\frac{Z}{2r_0} r\right) \cdot \sin\theta \cdot \exp(-i\varphi)$
3	0	0	$\frac{1}{81\sqrt{3\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(27-18\frac{Z}{r_0} r+2\left(\frac{Z}{r_0} r\right)^2\right) \cdot \exp\left(-\frac{Z}{3r_0} r\right)$
3	1	0	$\frac{\sqrt{2}}{81\sqrt{\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(6-\frac{Z}{r_0} r\right) \cdot \frac{Z}{r_0} r \cdot \exp\left(-\frac{Z}{3r_0} r\right) \cdot \cos\theta$
3	1	+1	$\frac{1}{81\sqrt{\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(6-\frac{Z}{r_0} r\right) \cdot \frac{Z}{r_0} r \cdot \exp\left(-\frac{Z}{3r_0} r\right) \cdot \sin\theta \cdot \exp(i\varphi)$
3	1	-1	$\frac{1}{81\sqrt{\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(6-\frac{Z}{r_0} r\right) \cdot \frac{Z}{r_0} r \cdot \exp\left(-\frac{Z}{3r_0} r\right) \cdot \sin\theta \cdot \exp(-i\varphi)$
3	2	0	$\frac{1}{81\sqrt{6\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(\frac{Z}{r_0} r\right)^2 \cdot \exp\left(-\frac{Z}{3r_0} r\right) \cdot \left(3\cos^2\theta - 1\right)$
3	2	+1	$\frac{\sqrt{2}}{81\sqrt{\pi}}\left(\frac{Z}{r_0}\right)^{3/2}\left(\frac{Z}{r_0} r\right)^2 \cdot \exp\left(-\frac{Z}{3r_0} r\right) \cdot \sin\theta \cdot \cos\theta \cdot \exp(i\varphi)$