

$$\psi_{200} = \frac{1}{\sqrt{\pi}} \left(\frac{z}{2a_0}\right)^{3/2} \left(1 - \frac{zr}{2a_0}\right) e^{-\frac{zr}{2a_0}}$$

$$\psi_{211} = \frac{1}{\sqrt{\pi}} \left(\frac{z}{a_0}\right)^{3/2} \left(\frac{zr}{8a_0}\right) e^{-\frac{zr}{2a_0}} \sin\theta e^{i\phi}$$

$$\psi_{210} = \frac{1}{\sqrt{\pi}} \left(\frac{z}{2a_0}\right)^{3/2} \left(\frac{zr}{2a_0}\right) e^{-\frac{zr}{2a_0}} \cos\theta$$

$$\psi_{21-1} = -\frac{1}{\sqrt{\pi}} \left(\frac{z}{a_0}\right)^{3/2} \left(\frac{zr}{8a_0}\right) e^{-\frac{zr}{2a_0}} \sin\theta e^{-i\phi}$$

e level  $E_2$  is 4-fold degenerate.