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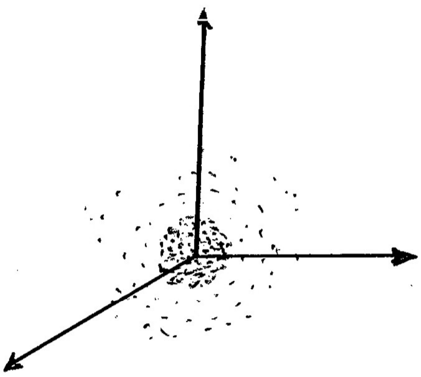
ψ There is no classical way to describe wave function
(There is physical interpretation)

$$\left[\psi^2_{nlm}(r,\theta,\phi)\right]^2 = \text{PROBALITY DENSITY}$$

probality of ē in small volume in nucleus
(max Born)



we can break up ong ψ into Two components

$$\left[\psi_{nlm}(r,\theta,\phi)\right] = R_{nl}(r) \times Y_{lm_l}(\theta\,\phi)$$

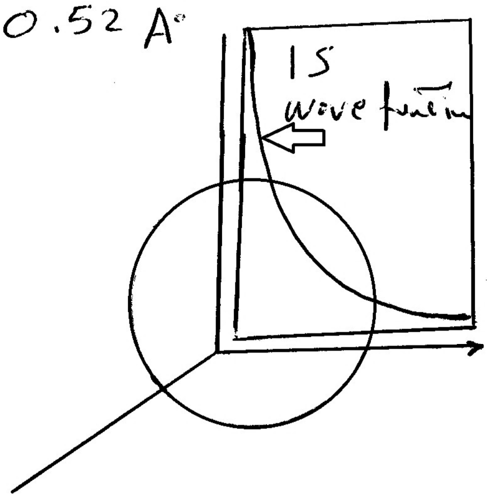
$R_{nl}(r)$ → Radial ψ; $Y_{lm_l}(\theta\,\phi)$ → angular ψ

For Ground state (1S) H Atom

$$\psi_{100}(r,\theta,\phi) =$$

$$\underbrace{\frac{2e^{-r/a_0}}{a_0^{3/2}}}_{R(r)} \times \underbrace{\left[\frac{1}{4\pi}\right]^{1/2}}_{Y(\theta,\phi)} = \frac{e^{-r/a_0}}{(\pi a_0^3)^{1/2}}$$

where (a_0) is bohr radius (a constant)
= 52.9 pm
= 0.52 A°



S-orbitals are spherically symmetric
independent of θ and ϕ only on r

for all orbitals (1S, 2S, 3S, etc) Y is a constant