**Atoms stationary state (Raofa) : Schrodinger's time independent representation of wave function**

A stationary state has factorized space and time dependencies. $\phi(x,t)$ is a stationary state if it can be written as the following

$$\phi(x,t) = g(t)\phi(x)$$

However, if the atom has one definite energy and tries to measure its probability, it will be independent of time. Thus, an atom in a definite energy level is in a stationary state. If you make any measurements of it, there will be no change in probability over time.

If the internal parts of an atom are in different states with a different total energy, then the variation of the amplitude with time is different. If you don't know in which state it is, there will be a certain amplitude to be in one state and a certain amplitude to be in another, and each of these amplitudes will have a different frequency. There will be an interference between these different components which can show up as a varying probability. Therefore, some interactions will take place inside the atom.