Re: Critical size (or Mass?) of the particle at which Macro transitions to Micro (Ref: Double Slit Experiment)

Source: http://sci.tech−archive.net/Archive/sci.physics/2006−04/msg02694.html

- *From*: "PD" <TheDraperFamily@xxxxxxxxx>
- *Date*: 19 Apr 2006 05:19:28 −0700

Ravindra wrote:

> I think I got some clarity with the probability waves explanation and at the same time got some more questions as well...
> Lets assume that the electrons are fired one after the other in the double slit experiment...Probability waves explain the interfernce pattern observed and the reasoning goes that the probability wave of a single electron would travel through both the slits and hence it interferes causing an interference pattern. When we put a detector at one of the slits (either direct / indirect detection of the electron), the interference pattern is not found because the probability wave sharpened into the slit where we detected this electron...Till here it is fine...
>
> Case 1. Lets say we repeat the same experiment (thought experiment!) with needles fired one after another...Going by the same probability wave explanation should we identify interference pattern with needles? (lets say I chose all the required distances, slit separation width, screen size all of those etc., hypothetically) ...
>
> OR
>
> Case 2. We dont observe interfernce because I can clearly see with my eyes which slit the needle is passing through (it is visible) without any need of detectors!!
>
> Case 3. Lets say I repeat Case 2 with needles but now in a closed chamber and I cannot see till the entire experiment is over so that Case 2 is no longer valid. Now will I see the interference pattern? If yes, then I have some more questions:
> a. In case of electrons it is understood that a detector presence / presence of light disturbs/alters the probability wave of an electron (Using uncertainity principle)
> b. But in the case of needles, I am not using any detector but is clearly visible to the naked eye to see the needle as to which slit it

> is passing thorugh...So how can the mere act of seeing without any presence of detectors etc., alter the probability wave of needles?

Stop. Run, do not walk, to the nearest 2nd−hand bookstore and purchase a copy of Feynman's book, The Character of Physical Law.

There is a lovely chapter in there that talks extensively about the double−slit experiment and what happens if you watch the "things" pass through the slits.

PD

.