Re: High data rate in narrow band − Why doesn't it work?

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On Sat, 14 Aug 2004 15:23:01 +0200, Gilbert Netzer <noname@aon.at>
wrote:

>
>so now using the famous uncertainty relation of heisenberg delta x and delta p
>are related by:
>
>delta x * delta p >= h/(2*pi)
>
>which means that:
>
>delta t >= h / (2*pi*c* delta p)
>
>which gives:
>
>delta t >= 1/ (2*pi*delta f)
>
>this simply means that if you try to make a detector that very excatly
>determines the impulse of your photon, it will not be able to tell you
>very accurate when that photon actually hit it, and it just so happens to
>fit nicely into the classical wave model physics, which is just so really
>convenient...
>
>best regards
>gilbert netzer
>

I visualize this as considering that a "wideband" photon is a quick wigwag in space (sort of like a single cycle of a sine wave) and a "narrowband" photon is a big, sloppy bunch of sine cycles with peak amplitude in the middle, sort of like a Loran pulse. But if the detector is a quantum device, it can only report a single "receive" event, so the first pulse is resolved within one cycle but the slow one might fire the detector anywhere within the wide envelope. The slow pulse is what you get if you force the fast pulse through a narrowband filter, and that inherently makes the timing uncertain.

So the Uncertainty Principle is just what happens of you apply
electronic waveform filtering ideas with a quantum detector.

John