

## 'Picture' of electromagnetic radiation carriers as photon Bits and Bobs

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### Abstract

Quantum physics gives us the idea that quantum particles' behaviour , such as that of photons require giving up locality or realism. That is relinquishing; That causes are local or locally mediated and that things are real before measurement. Maybe the fundamental concept is wrong, giving wrong conclusions. Reconsidering photons: What other 'picture' fits the facts we know? How are they formed? What's missing? Does it have explanatory advantages?

## 'Picture' of electromagnetic radiation carriers as photon Bits and Bobs

### By the way

[I want to suggest a different 'picture' of the 'photon. Partly because the names amuse me. Bits and Bobs is an English phrase usually meaning miscellaneous small items. Originating as a reference to the small parts of a carpenters tool kit. Other meanings can be found with Google search. Smallness is relevant to my usage but also other unitary meaning of [a] bit and connotation of [to] bob.]

### Info.

Photon is a quantum name. It means the quantum of electromagnetism. One unit of it. The photon in quantum field theory and quantum mechanics is very different from everyday things as we know them.

Those ideas won't be used here.

Some relevant ideas about photons. That will be considered;

They are said to be indivisible, as no part photons have been measured

They are 'packets of energy'

Their Energy is  $hf$

They have no mass

## Photon Bits [sounds like a unit quantity]

Lets start with what's measurable. We'll call the measurable/detectable entity a Photon Bit

They have no mass.

All kinds of existent matter have mass and can be called *things or somethings*- even as small as an electron or neutrino.

Attributes come along with mass especially lots of it –such as inertia, weight, resistance, gravitational attraction.

Not only is a photon Bit not a thing with mass, it is not no-thing without any differentiation from base existence. Its presence can be detected by exposure of a film camera emulsion for example. *It is a difference*. A vacuum is a difference too but also not a mass. If mass is concentration (and organizations) of base medium. Maybe the photon Bit is an absence of base existence.

Maybe as an electron violently jumps to a lower energy level it leaves a hole. (We can think of it as a bubble, though it does not have a differentiated boundary layer), which is ejected from the atom by conservation of energy. Moving equally and oppositely to the jumping electron. It is always the same amount of energy. An electron made bubble's worth.

That gives the photon Bit an 'origin story', a reason to exist.

## Energy

E is said to be planks constant times frequency.  $E=hf$  *That does give us a **constant** energy value, it is important that energy is a constant amount*, but also an association with frequency.

But the magnitude of the 'bubble' Bit and its energy of expulsion and direction of that are to do with the electron motion that forms the Bit. [so equal and opposite to the energy loss as the electron jumps. Ie. The 'bubble' gains the energy lost by the electron] Which is also different from the wave motion imparted by parent atom which gives frequency.

## Photon Bobs [sounds like to bob, wavelike]

*Energy is not an existing thing it is a happening.* A change of some kind or potential for that. It is usually **associated with** things with mass that do not just exist but are involved with happening. The happening can be described as energy changes associated with the thing. Energy is lost, gained or transformed.

What does ‘a packet of energy’ mean; it sounds like a concentration of happening. What, where, why? Can this concentration of happening be associated with the ejected photon bit ‘bubble’?

We then have a Bit/Bob photon. *A non matter particle associated with a concentration of happening.*

### Why the Bob-

so far we’ve just considered that ejection of the Bit happens

It is always the same amount of energy. An electron made bubble’s worth.

What about frequency?

As the parent atom vibrates the frequency of it is imparted to the exiting photon bit. The amount of vibration will depend on the thermal energy ie heat of the atom and the chemical structure in which it is found, which determines in what manner vibration can occur.

*This gives us a particle like unit entity (Bit) with fixed amount of measurable energy. That is also associated with a particular frequency(Bob).*

### Missing pieces

Momentum of a quantum photon is given as  $p=hf/c$  and  $p=h/\lambda$

A momentum  $p$  of thing with mass is usually given by  $mv$  where  $m$ =mass and  $v$ = velocity. Velocity is not just a quantity but a **vector**, so the momentum has direction. That means the thing with mass has a trajectory.

Very unlike the usual quantum field concept of a photon- by which reasoning doesn’t have an existence’ as we know it’ until measured. The photon doesn’t travel A to B

### Momentum of existent things

The probability of a basket ball going through a hoop depends on the size of the hoop and size of the ball but importantly also the trajectory of the ball in relation to the obstacle, Which is not a material characteristic of the existence called ball. As would be colour or logo or whether autographed or not. It is instead *about the happening* associated with the ball.

Oversize ball as big as hoop = definite won't.

Subtle change of trajectory = changed probability for normal sized ball.

#### Can we think about the ‘bubble picture’ photon Bits similarly

Likening above scenario to photon -Bit and polarizers. The asymmetry of the chemical structure of the polarizer provides the obstacle to be negotiated. The photon- Bit can be imagined to be like the ball that will or won't pass through. The flight path of the photon- Bit which is linked to -Bob is the missing variable that will give a probability of passing through or not. That isn't only one of two polarizations. But varies over 360 degrees of relative rotation to the polarizer. It is the probability of the happening pass or not which is being affected not definite will or won't

#### Bell's inequalities in this context

It seems like having 3 orientations of basket ball hoop and asking will or won't pass through questions of each basketball without knowing the trajectory of each throw. *The probability depends on the happening -how it happens not what it is ie state of existence.*

#### Speed

Being mass-less it has much less *resistance* (which happens when masses interact) to moving through the base existence than anything with mass. Allowing travel at the speed of light but not infinitely fast.

#### Separability of Bit and Bob

There is evidence from quantum experiments where there is wave interference patterns happening that shows Bit and Bob can be thought about separately. The Bit is always whole and of unitary value and the part that's detected. The Bob can be divided and recombine affecting the final location of the photon bit, which is detected. Part Bobs can not be detected. Effect on Bit location, due to the interference pattern, caused by Bob recombination, tells us the photon Bob was divided.

### Double slit

If the bubble like Bit has to pass through one or other slit remaining intact but the associated happening Bob can pass through both slits. Bob being an environmental experience of the existence of the Bit. The waves formed from the environmental disturbance Bob passing through both slits interfere. The interference pattern formed will produce a landscape of highs and lows which will give easier and more difficult possible paths that particle like Bit can take. A probabilistic landscape.

This is real particle wave duality being and happening.

### Conclusion

A new explanatory ‘picture’ has been shared. Gives a clear reason for the *wave particle duality* of these electromagnetic radiation carriers. Setting out what they are in relation to existence ‘bubble like’ and what they do- undergo wave motion, their happening. This is a useful ‘picture’, that gives an alternative possibility to understanding these ‘particles’ that does not require giving up on locality or local realism. Demonstrated by the explanatory power when applied to quantum experiments.