Re: Repulsion binds atoms

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- *From*: "Ken S. Tucker" <dynamics@xxxxxxxxxxx>
- *Date*: 21 Jun 2006 12:18:42 −0700

Edward Green wrote:

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> > > > Edward Green wrote:
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> > > > > I have some funny ideas
> > > > > about "force", BTW, though
> > > > > I'm not trying to
> > > > > develop them here.
> > > >
> > > > Ok, so did AE.
> > >
> > > Heh. Not _that_ funny idea. A different one.
> >
> > Well I'm listening.
>
> It's just this. Aside from forces which aren't forces (gravity), one
> can form the impression there are real forces, and things which look
> like forces, but express the creation of entropy; the rubber band
> contracts, we say, even though contraction is energetically neutral or
> even unfavorable for each uncoiled polymer, because of the
> configurational entropy. I just wonder if this principle isn't more
> universal, and perhaps there is really only one variety of force after
> all: that is, force is always a shorthand for the ability to create
> entropy, though sometimes where the entropy is being created may be

> less obvious than in the configurational entropy of the rubber band.
>
> An example may be provided by the coulomb force, considering the attraction of two like charges.

did you mean to say "like" charges?
I'll presume that's a typo unless you correct me.

> What will happen if the charges are
> allowed to accelerate towards each other?
>
> We agree on the answer to this one, they will radiate. And what does this mean? That the energy of the system goes down? Not at all, of course: the total energy stored in the field remains constant, but, from a first situation where the stored energy is localized around the static charges, some of the energy is literally radiated away to infinity. It is very reasonable to suppose that the overall entropy of the field increases. So at first glance may have looked like a static force which had nothing to do with entropy in reality seems to express a tendency to move in the direction of spontaneous change by increasing entropy.

Fair enough...

> My guess is that the class of forces which are really a measure of the potential to create entropy is much larger than usually thought, and possibly universal.

Ok, in your context, (well explained btw), would
the effect of gravity be anti−entropy?

> > Maybe it's
> > that old British Commonwealth comraderie... excluding, of course, above
> > referenced francophiles.
>
> Well, england was occupied by the french in
> 1066 and it remains an occupied nation ruled
> by aristocrats.
>
> So the whole aristocratic thing in England is an echo of the Norman invasion? Ironic that England also seems to have been the cradle of the closest approximation yet to a society governed by the principle of

> "equality".
>
> Ken Muldrew, whom I already mentioned, I believe was tinkering with some kind of quantitative theory of society in his spare time. One of his themes was −− to express it in my own words and I hope not too severely garble his −− a tendency for parasitism to approach an equilibrium level. Another general theorem on society might involve the tendency towards stratification: inheriting it from invasion is one route, but start with as much egalitarianism as you can muster, and probably class formation is inevitable.

Ok, I figure we can be egalitist, because I can have $billions as a professional capitalist, as money is a tool, paper work really, that I use in my profession. Money properly invested enhances peoples lives just as a plumbed toilet does.

> But then
> you would
> want to ask
> about
> "Electron
> Beam
> Lithography"
> or "Electron
> Microscopes".
> I haven't
> found
> evidence
> a pair of
> free
> electrons
> will radiate,

> I don't follow you. Are you saying there is no radiation in these devices associated with the spreading of the electron beams?

> Yes, the radiation is nil, justas the radiation of a current path in Super Conductor is nil.

> At the risk of being obtusely persistent, shall I take it, at least

> for
> the first two examples, that the beam spreads just about as would be
> predicted for a given flux density of classical electrons travelling in
> parallel, or is there some quantum effect which forbids this?

IMHO, I cannot knowledgeably explain a beam spread.

> Am I
> really wrong in thinking a pair of similar classical charges, free to
> move apart from one another would radiate?

In order to adopt that belief, you would need
to have some understanding as to how a photon
or EM wave is emitted by that process, other−
wise I'd keep an open mind.

> I thought of a crude argument why this might be correct: imagine a
> spherical shell of charge, held at a fixed radius until time t_0, then
> released to expand. To the best of my knowledge Gauss's law applies in
> dynamic as well as static situations. Combining this with the
> spherical symmetry, we conclude that the electric field outside the
> expanding shell never changes in advance of the shell. What about the
> magnetic field? We do have a blip of dE/dt as the shell passes, so I
> suppose we also have a blip of H (a singular blip at that). But that's
> it. No radiation.

That's a cool gedanken, but your dE/dt needs
a reference to measure that, and that in turn
will produce EMR.

I don't follow that. Forget about what happens at the interface, I
seem to have reached the conclusion that a uniformly expanding
spherical shell of charge will produce zero outgoing signal of any kind
−− never mind if we are going to qualify some signal as "radiation".
I'm not sure I believe this, but I can't find the flaw in my argument.

> Can you?

Oh boy, I'll try....hmmm...ahh...well....
If the sphere expands, it's electrical potential
energy reduces, (q^2/r).
That reduction of system energy, I think, would
be radiated.

> > But the two point−like charges lack this full spherical
> > symmetry, and
> > I'm still not sure what happens qualitatively. Do we get a
> > cylindrically symmetrical disturbance whose distant field
> > strength
> > falls faster than 1/r?
>
> I think that depends upon how you measure
> those effects.

> Certainly whether there is radiation depends on a careful definition.
> I'm certain there is some outgoing signal in this case, though it might
> all qualify as "near field" or "evanescent field".

Well there is very specific set of circumstances
that create a photon aka EM−wave, and what
you have set in quotes is somewhat ambiguous.
I'd be inclined to rely on reasonable theory and
evidence, perhaps with a reference, otherwise
we may loose focus.
Regards
Ken

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