Re: Since k varies but not G suggests an Eather

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- *From*: "guskz@xxxxxxxxxxx" <guskz@xxxxxxxxxxx>
- *Date*: 23 Jun 2006 04:02:41 −0700

Randy Poe wrote:

> guskz@xxxxxxxxxxx wrote:
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> > Randy Poe wrote:
> >
> > > guskz@xxxxxxxxxxx wrote:
> > > Why do you say nothing is neutral? If you have equal
> > > amounts of positive and negative charge, the net
> > > charge is zero.
> >
> > Ok, the dipole moment then aint zero, P = Qd and it's Q aint zero.
> > Otherwise H2O would never form?
>
> What?

My mistake, if a dipole moment is never zero why does a quadrupole
moment = zero when it's spherical?

> > > > and only the field shrinks as Randy said the
> > > > residual force of dipole charges is 1/r^3
> > >
> > > Yes, if:
> > > (a) your + and − charges are separated so that
> > > you have a net polarization. Just because you have
> > > + and − charges doesn't mean they have to separate.
> > >
> > > (b) r is large compared to the separation between
> > > the charges.

> > Ok but if "r" was the same distance as the separation then the forces
> > and charges would not be neutral.

> What do you mean by forces being neutral?
>
> The expression for the force from a charge Q and a charge −Q
> on a charge q is F = kQq*(1/r1^2 − 1/r2^2).
>
> If r is the same distance as the separation, then the approximation
> used to convert (1/r1^2 − 1/r2^2) to 2*sin(theta)/r^3 (or whatever the
> correct expression is) breaks down. Instead you can use the
> exact value of (1/r1^2 − 1/r2^2).

When Q and −Q are neutral, due to the constant known velocity of charges in space thus "d" between them is a known constant (when they're paired into a dipole), so say "r" (of q) is = 1.5 d at first:

1. Does q orbit Q and −Q?

2. Does r remain at 1.5d when it returns to the same angle in it's orbit or does it keep moving farther and farther away for the dipoles?

> > I see "d" (P=Qd) as the related to the normal velocity of the charges

> You shouldn't, since it isn't a velocity.

Bad writing I ment: I see "d" as a constant distance which is related (regulated) by the normal velocity of the charges in space (since velocity is an anti−attraction phenomena...the higher the velocity of the attracting charges the bigger "d" between them).

> > only and that all fields simply shrink with "d",

> What?

The Electric field shrinks volume wise as the charges get closer together?

The charges may be neutral but not the electric field

Electric fields aren't charged.

No but their entire value is related to the charges times the permittivity constant: (Qxq and r^2 which is determined by the velocity and polarities of Q &q)

otherwise if another charge whose "r" is almost the same as "d" would feel no effect.

What?

What....does charges being neutral "mean" to you?

It means they no longer have the same sex appeal (attraction repulsion forces) as they once did as when they where single. This sex appeal is the attraction/repulsion Force Field also known as the Electric field.

But in true nature: if q = neutral = 0 then Electric field would = 0 (since E= kQq/r^2) = none sense?

With large objects at ordinary macroscopic differences, this is usually true. The force between you and the earth is dominated by the gravitational force. There's no net charge on you or the earth, so no electric force between the two of you.

I think the velocity of the charges is also related to the permittivity of space, and if so would this velocity of the charges change in a dielectric (since light's "c" does)? ....and therefore would "d" also change?

You can think stuff which is totally at odds with all of our experience and theory, but that won't make it true or even plausible.

It was a question not a statement:

1. light and other waves slow down in dielectrics therefore does the velocity of charges also slow down?

2. I think the distance between dipoles is related to BOTH their attraction force and velocity, therefore if the velocity in #1 changes therefore does the distance between dipoles also change??

> > > If you have two dipole charges, does the residual remain at 1/r^3 or is it more or is it less?

> > It depends on how they are arranged and where you are situated. You can have two dipoles which will give a field that looks like one stronger dipole. You can have two dipoles cancelling each other out so what is left is the quadrupole moment (1/r^4 force). You could be located near to the dipoles in which case you have to use the exact expression, sum(kQq/r^2), not the approximation 1/r^3.

> I read that normally the quadpole is spherical thus neutral...

That's a little confused, but I can see what you read buried in there.

It's one of Sue's links, Electric Quadrupoles at:
http://hyperphysics.phy−astr.gsu.edu/Hbase/electric/elequad.html#c1

(ellipsoidal quadpoles are non−neutral, spherical are neutral)

1. You can have a net charge, in which case you'll see monopole fields, E ~ 1/r^2.

2. You can have an arrangement of charges with net charge zero but a dipole moment, in which cases at large distances E ~ 1/r^3.

3. You can have an arrangement of charges with net charge zero and dipole moment zero but a nonzero quadropole moment, in which cases at large distances E ~ 1/r^3.

And so forth.

Ok but how would quadpoles (as the link above says) be 100% neutral
....doesn't that mean no "r" at all (no 1/r^2...no 1/r^3...etc)

maybe for
hydrogen but for other atomic mediums the arangement due to the nucleus
in any cross−section of the sphere (excluding neutrons) is:
− − − − − − − − + + + + + + + + − − − − − − − − − pole (protons
grouped together in nucleus)?

The protons are in the nucleus. I don't know what else you're
trying to say. The nucleus is very small compared to the atom,
so the protons are "grouped together". If those "−−−" symbols mean
you think there are electrons in the nucleus, that's wrong.

no no, forgeting the neutrons...you have a sphere with protons in the
core and electrons around it, slice the sphere into a cross−section you
have a circle with electrons surrounding protons in the center,
.......then take *ANY* straight line across that circle and you have a
line of e e e e e e e p p p p p p p p e e e e e e e e e (the "− −" were
the arrangement of electrons).

What would be the force for those (1/r^4??)

F = k Qq/r^2 where r is the LINEAR distance between charges, we were
talking about quadpoles (or more), so I took a cross section of an atom
and the most ****POPULAR**** position(orientation) for charges in space
(say only quadpoles) would be this orientiation:

e p p e (so what is the force relation for such an orientation
1/r^2 or 1/r^4 or less or more?)

(Therefore again doing my cross−section above, an eigth pole would be e
e p p p p e e..... all though this arrangement is due to the presence
of gluons forcing the protons together in the center of the atom)

I can't figure out what "those" refers to.

Not really a dipole moment but a dipole wave

What?

The charges are not fixed in space, they are always in motion and not only in motion but orbiting each other, therefore the dipole moment is a dipole wave BECAUSE it is always varying in space due to it's orientation in TWO WAYS:

#1: The paired charges are orbiting each other thus the dipole moment is also spinning.

#2: pretend "q" is not moving in space and at a constant distance "r" from the dipole (Q & −Q),

as the dipole is spinning (as in #1) the force (P= Qd thus the magnitude of Q instead) of the dipole moment changes also and this variation is in the form of a wave (example when q is exactly between Q & −Q...the dipole moment or force is neutral, when q is closest to Q then the dipole moment is at it's peak....all these variations with time cause a dipole wave of a specific frequency(frequency's value related to the spin velocity of the dipole).

therefore q will not under go a dipole moment but a dipole WAVE with a specific FREQUENCY, a specific AMPLITUDE (related to q's "r" distance from dipole) ?

As well for hydrogen, negative charges(e) must always be orbiting around the heavier charge (p) ??

No, electrons are not in orbit in atoms.

... therefore creating dipole moment
pulses (a constant oribiting frequency of dipolar force as the electron orbits the proton, therefore the dipolar moment would be a wave force of a specific frequency and not a specific value....but

No. Not in an atom. However, it is true you could create a situation like this with a macrosopic arrangement, and you'd get an oscillating dipole field. I don't know what you mean by "not a specific value". Of course it has a value.

> Perhaps why this dipolar frequency in a dielectric cannot affect high frequency EM waves (since the dipolar frequency is slower)?

There's no such dipolar frequency due to orbits since they don't exist.

??? Newton's law says that velocity requires a straight path but since the paired charges are attracted to each other therefore they are orbiting each other due to their attraction force and due to their velocity (velocity = anti attraction and forms and causes them to orbit (spin around) each other??? And for that reason the dipole moment is always spinning in space (meaning the batteries polarities are not fixed in space but rotate)??

There are resonant frequencies when dipoles are free to oscillate, such as in H_2O. H_2O resonates very nicely with frequencies in the GHz, which is why microwave ovens work.

> (Wikepedia says dielectric mediums (force wise) only affect static charges and slow frequency EM waves)

That would indeed have something to do with how fast the dipoles wiggle, but it's not connected to electrons orbiting around nuclei.

?? electrons do not travel in straight paths ...they in an atom ORBIT around a nucleus or a proton???

> Also I don't know if this frequency would be a nice sine wave since I believe in a previous post with you Randy long ago, that the force varies considerably with each angle between dipoles???

Yes, "wiggles" are typically "nice sine waves".

> (Forgot which
> post). ....or was it that the force would be neutral if the 3rd charge
> was exactly perpendicularly in between the dipoles at distance "r"?

> Dipole force varies with sine of the angle (or cosine, depending on
> how you define the angle). That's why a rotating dipole would give
> a force which varies as a sine wave.

thus not a dipole moment but a dipole wave....correct??

> But an atom is not a rotating dipole.

????

> − Randy

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