Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Mon, 04 Jul 2005 19:05:30 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35503
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Mon, 4 Jul 2005 19:06:48 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave and All,

I got the DRSSTC fixed this afternoon and tried to reproduce Dave's unequal spark test.

http://www.tesla-coil-builder.com/images/chiron01twosparks.jpg

My theory was this:

====
http://hot-streamer.com/temp/DaveTest.gif

The bright i3 current to ground is the sum of current i1 from the top terminal plus the current i2 picked up by the partially conductive florescent tube near the secondary high voltage regions. I show how such a setup and results should be repeatable on a standard coil too.

I think you mean to suggest that the currents i3 and i1 are equal. But I suggest that i2 is causing much of the effect. Simply replacing the conductive tube with a Styrofoam rod with a similar metal tip from a broken tube will eliminate almost all of the i2 currents. Then the currents going through the two arcs will be equivalent. Normally in this configuration, the voltage between the tube tip and the top terminal would be relatively low.

Also, the two spark gaps need to have the same terminal types (say sharp tips) to be comparable. The round top terminal is obviously spreading the spark out unlike the top arc which is between two sharp points.
====

So I set up the second situation with the DRSSTC coil which is conventional other than the DRSSTC driver.

http://hot-streamer.com/temp/DaveTest-01.jpg

Nothing fancy, just an 18 inch florescent tube end between the top of the coil and a grounded wire. The tube was just taped to an ungrounded little tripod. The tube was parallel to the coil so the displacement current could reach the tube as described in my diagram above.

Now for the exciting results!! ;-)

http://hot-streamer.com/temp/DaveTest-04.jpg

http://hot-streamer.com/temp/DaveTest-03.jpg

http://hot-streamer.com/temp/DaveTest-02.jpg

My pictures are not as pretty as Dave's, but the effect is very plain and obvious. Very easy to reproduce...

I was going to smash the tube and just try the end on a Styrofoam rod as I mentioned. But I don't have the rod and it is one of those real expensive aquarium grow tubes... But I can pick up a cheap tube and rod tomorrow...

So far, the effect seems to be very simply Ampere's law with Maxwell's displacement currents and Kirchhoff's current law here on page 6 of the circuit theory book. I never could have spelled Kirchhoff myself ;-))

Cheers,

Terry

</x-flowed>
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Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Mon, 04 Jul 2005 20:33:27 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35506
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Mon, 4 Jul 2005 20:33:30 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Terry,

> Now for the exciting results!! ;-)
>
> http://hot-streamer.com/temp/DaveTest-04.jpg >
> http://hot-streamer.com/temp/DaveTest-03.jpg >
> http://hot-streamer.com/temp/DaveTest-02.jpg >
> My pictures are not as pretty as Dave's, but the effect is > very plain and obvious. Very easy to reproduce...
>
> So far, the effect seems to be very simply Ampere's law with > Maxwell's displacement currents and Kirchhoff's current law > here on page 6 of the circuit theory book. I never could > have spelled Kirchhoff myself ;-))

This is great!

Let's look at the theory you are presenting. You are producing the same result

that I am, and quantifying the same effect.

According to my theory, the electrons are manifesting in two different modes. One is a high potential, low current mode, and the other is a low potential, high current mode.

Let me put it this way, if there is just one form of charge, then there would be just one color and thickness of spark, but of varying intensity.

Do you think you can measure the potential and current of those individual sparks? If it turns out that both sparks have the same potential, then that would indicate there is just one type of charge. But if it turns out that the potential from topload to vacuum tube is greater than from vacuum tube to ground, then it would indicate two different modes of charge.

I have another problem with your hypothesis. According to Kirchhoff's law, the current going in is equal to the current going out. According to Ohm's law the current is going to take the path of least resistance. If the vacuum tube is connected to ground, why would the displaced currents flow away from ground and toward the resistance of the spark gap and the potential of the topload?

According to your analysis, there should be more power from the vacuum tube to the ground than there is between the topload and vacuum tube. I wonder if this is true. If it turns out that displacement currents are feeding current to the tube, then that might mean we have evidence for longitudinal waves. This is the type of power transmission that Tesla claimed in his Wardencliffe design. Also, how do you explain that current is being received in the tube other than by induction? It is one thing to displace currents, it is another thing entirely to pick them up and use them.

This really is exciting.

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Mon, 04 Jul 2005 21:10:42 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35507
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Mon, 4 Jul 2005 21:11:26 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

At 08:24 PM 7/4/2005, you wrote:
>Hi Terry,
>
> > Now for the exciting results!! ;-)

> >
> > http://hot-streamer.com/temp/DaveTest-04.jpg
> >
> > http://hot-streamer.com/temp/DaveTest-03.jpg
> >
> > http://hot-streamer.com/temp/DaveTest-02.jpg
> >
> > My pictures are not as pretty as Dave's, but the effect is
> > very plain and obvious. Very easy to reproduce...
> >
> > So far, the effect seems to be very simply Ampere's law with
> > Maxwell's displacement currents and Kirchhoff's current law
> > here on page 6 of the circuit theory book. I never could
> > have spelled Kirchhoff myself ;-))
>
>This is great!
>
>Let's look at the theory you are presenting. You are producing
>the same result that I am, and quantifying the same effect.

Yes, it is easy to reproduce. If we can agree that just a tube on Styrofoam will have "equal" sparks, I will spare our atmosphere the mercury vapor release...

>According to my theory, the electrons are manifesting in two
>different modes. One is a high potential, low current mode, and
>the other is a low potential, high current mode.
>
>Let me put it this way, if there is just one form of charge, then
>there would be just one color and thickness of spark, but of
>varying intensity.

??? I don't get that... Looks like just simple basic field theory stuff to me... I see nothing that is not explained easily and perfectly well by the 150 - 200 year old laws of electricity as told by Ampere, Maxwell, and Kirchhoff in the early to mid 1800's...

>Do you think you can measure the potential and current of those
>individual sparks?

One could reproduce the same in a salt water bath or field potential program. I think the program out there called "Bela" could do it. But there are many others. It is a very basic FEA fields thing.

http://femm.berlios.de/bela.htm

You really should do it on a 3-D simulator, but nobody here has the super computer to handle that stuff... Some like E-Tesla could fake that and work, but not easily in this case...

>If it turns out that both sparks have the
>same potential, then that would indicate there is just one type
>of charge. But if it turns out that the potential from topload
>to vacuum tube is greater than from vacuum tube to ground, then
>it would indicate two different modes of charge.

It seems obvious from the photos that the top of the tube is near the same potential as the top of the coil... That is certainly just as expected from plain

old field theory...

>I have another problem with your hypothesis. According to
>Kirchhoff's law, the current going in is equal to the current
>going out. According to Ohm's law the current is going to take
>the path of least resistance. If the vacuum tube is connected to
>ground, why would the displaced currents flow away from ground
>and toward the resistance of the spark gap and the potential of
>the topload?

The bottom of the tube is not grounded, other than some electrostatics effect where displacement currents couple the AC to ground....

>According to your analysis, there should be more power from the
>vacuum tube to the ground than there is between the topload and
>vacuum tube. I wonder if this is true. If it turns out that
>displacement currents are feeding current to the tube, then that
>might mean we have evidence for longitudinal waves.

Paul has mentioned the "longitudinal waves" as Tesla defined them, are just like our "not so modern" displacement currents.

>This is the
>type of power transmission that Tesla claimed in his Wardencliffe
>design.

Yes, Tesla was trying to couple to the upper atmosphere with displacement currents... He used to like the term longitudinal waves. It is not clear if her understood the new (at that time) work of Maxwell and Heaviside...

>Also, how do you explain that current is being received
>in the tube other than by induction?

Obviously, displacement currents!!

http://hot-streamer.com/andrewb/models/models.htm

I just wonder how displacement currents "actually work". The fact that they "do work" is obvious...

>It is one thing to displace
>currents, it is another thing entirely to pick them up and use
>them.

There are billions of capacitors on Earth that do that every day!!! ;o)))

>This really is exciting.

It is sort of a neat way to demonstrate field effects.... But I really honestly see zero "new" theory to any of it :-|

I think Maxwell could have easily seen what was going on in his day...

I don't see anything that is new....

Cheers,

Terry

>Dave

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X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 11:57:04 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35510
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 12:04:15 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Terry,

> >Let's look at the theory you are presenting. You are producing the
> >same result that I am, and quantifying the same effect.
>
> Yes, it is easy to reproduce. If we can agree that just a > tube on Styrofoam will have "equal" sparks, I will spare our > atmosphere the mercury vapor release...

If you are talking about breaking off the tube end, that isn't necessary. Any piece of aluminum on the end of the Styrofoam should have the same effect. I haven't tried the effect with a non-vacuum tube in between the topload and ground. But I have tried the effect with a tube that was not grounded. I got the same results whether the tube was grounded or not.

> >According to my theory, the electrons are manifesting in two different
> >modes. One is a high potential, low current mode, and the other is a
> >low potential, high current mode.
> >
> >Let me put it this way, if there is just one form of charge, then there
> >would be just one color and thickness of spark, but of varying

> >intensity.
>
> ??? I don't get that... Looks like just simple basic field > theory stuff to me... I see nothing that is not explained > easily and perfectly well by the 150 - 200 year old laws of > electricity as told by Ampere, Maxwell, and Kirchhoff in the > early to mid 1800's...

How do you explain the difference in color of the sparks? One is purple, the other is bright white. If there is just one manifestation of charge, shouldn't you be able to get a bright purple, or thin white spark?

The fact that there could be electrons between a high potential and low potential

and manifesting in two very different modes seems not to be explained by the above laws. I don't see anything in those equations that would suggest such physical appearances. Yet, you see the different modes for yourself.

> >Do you think you can measure the potential and current of those
> >individual sparks?

> You really should do it on a 3-D simulator, but nobody here > has the super computer to handle that stuff... Some like > E-Tesla could fake that and work, but not easily in this case...

I think we should not calculate the answers, but measure them.
Once we have actual measurements, then we can verify whether the present equations calculate the data or not. Also, unless there is some way to prove that both the sparks have the same characteristics, we need to understand why the different appearances.

> >If it turns out that both sparks have the same potential, then that
> >would indicate there is just one type of charge. But if it turns out
> >that the potential from topload to vacuum tube is greater than from
> >vacuum tube to ground, then it would indicate two different modes of
> >charge.
>
> It seems obvious from the photos that the top of the tube is > near the same potential as the top of the coil... That is > certainly just as expected from plain old field theory...

I can't tell if we are talking about the same thing or not. Are you saying that it looks like the potential from the topload to the vacuum tube is the same from the vacuum tube to ground? What makes you say that?

> >I have another problem with your hypothesis. According to Kirchhoff's
> >law, the current going in is equal to the current going out.
According
> >to Ohm's law the current is going to take the path of least resistance.
> >If the vacuum tube is connected to ground, why would the displaced
> >currents flow away from ground and toward the resistance of the spark
> >gap and the potential of the topload?
>
> The bottom of the tube is not grounded, other than some > electrostatics effect where displacement currents couple the > AC to ground....

Okay, try grounding the bottom of the tube and see what happens.
This is what I was going to try before my transformer gave out.
It would be in your favor if the sparks looked the same when the bottom of the tube is grounded.

> >According to your analysis, there should be more power from the
> >vacuum tube to the ground than there is between the topload and
> >vacuum tube. I wonder if this is true. If it turns out that > >displacement currents are feeding current to the tube, then that
> >might mean we have evidence for longitudinal waves.
>
> Paul has mentioned the "longitudinal waves" as Tesla defined > them, are just like our "not so modern" displacement currents.

I would agree.

> >This is the

> >type of power transmission that Tesla claimed in his Wardencliffe
> >design.
>
> Yes, Tesla was trying to couple to the upper atmosphere with displacement
> currents... He used to like the term longitudinal waves. It is not clear
> if her understood the new (at that time) work of Maxwell and Heaviside...

Yes, he did. He publicly stated that Heaviside was wrong (and turned out to be wrong, himself).

> >Also, how do you explain that current is being received > >in the tube other than by induction?
>
> Obviously, displacement currents!!
>
> http://hot-streamer.com/andrewb/models/models.htm >
> I just wonder how displacement currents "actually work". The > fact that they "do work" is obvious...

But that is exactly what I'm getting at. In order for displacement currents to work, there must be a quantifiable mechanics somewhere that explains the process.

According to my theory, the potential grid would probably look similar to your voltage grid models. But there is also a current grid that is 90 degrees out of phase with the potential grid and expands toward the ground side of the coil. I would venture to say that the displacement currents are the result of the current grid, not the potential grid. In addition, my theory predicts that a conical or flat spiral secondary coil will have a greater current grid for the same amount of power than does a solenoid secondary coil. Also, the taller and skinnier the solenoid secondary coil, the greater the potential grid will be. A combination flat spiral and tall solenoid coil, like those I build, will maximize the current and potential grids.

After studying Tesla's patents and other writings, I'm convinced that his Wardencliffe tower used this configuration for the secondary.

> >It is one thing to displace
> >currents, it is another thing entirely to pick them up and use > >them.
>
> There are billions of capacitors on Earth that do that every > day!!! ;o)))

I'm not saying it cannot be done. I'm saying that just because we can say the words "displacement currents" does not mean we know *how* those displacement currents cause electrical currents in a remote conductor. And since the displacement currents are traveling through an insulator, we need to quantify what it actually is that is carrying the displacement currents. Maxwell identified the medium as the Aether, but I suspect you don't agree with Maxwell on this point.

> >This really is exciting.
>
> It is sort of a neat way to demonstrate field effects....
> But I really honestly see zero "new" theory to any of it :-|

That's true. The "new" theory I am talking about is really the old Aether theory, but based upon modern measurements.

> I think Maxwell could have easily seen what was going on in his day...

It's funny you would say that.

The fact is, in order for something to have an effect, it must be real. In the modern interpretation of EM theory, the field is just a mathematical construct. In Maxwell's time, it was the Aether. What my theory shows is that Maxwell was right about the Aether. My theory also shows that there are two distinct quantifications of charge, one which matches the electrostatic charge behavior, and the other matches the electromagnetic charge behavior.

It is interesting to me that it can be proven, at least visually so far, that there are indeed two distinct manifestations of charge, which matches the quantities derived from the empirical data.

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
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Date: Tue, 05 Jul 2005 11:57:27 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35509
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 12:04:12 -0600 (MDT)

<x-flowed>
Original poster: Jim Lux <jimlux@earthlink.net>

At 07:33 PM 7/4/2005, Tesla list wrote:
>Original poster: "David Thomson" <dwt@volantis.org>
>
>
>I have another problem with your hypothesis. According to
>Kirchhoff's law, the current going in is equal to the current
>going out.

Kirchoff's laws apply to DC (or steady state AC) circuits with conductors, that is, with discrete points and nodes. It's not entirely clear that you could apply them to regions of space (although, fundamentally, that's what FDTD type models do). Kirchoff also isn't so easy to apply to cases where the propagation speed of the wave is important (i.e. transmission lines)

> According to Ohm's law the current is going to take
>the path of least resistance.

Not precisely.. the current will distribute in inverse proportion to the resistance. And, again, when you start talking about time varying fields with some significant physical extent, "resistance", which is a DC phenomenon, doesn't tell the whole story.

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X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 12:00:36 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35513
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 12:04:37 -0600 (MDT)

<x-flowed>
Original poster: stork <stork@awall.clearwire.net>

Terry,

Can you tell exactly where and how Kirchhoff's current law applies to this circuit?

Stork

>So far, the effect seems to be very simply Ampere's law with Maxwell's
>displacement currents and Kirchhoff's current law here on page 6 of the
>circuit theory book. I never could have spelled Kirchhoff myself ;-))
>Cheers,
>   Terry

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Date: Tue, 05 Jul 2005 12:57:04 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35516
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 13:12:31 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi,

I did not mean to cause confusion...

Kirchhoff's current law is a very simplified version of Gauss's law and the conservation of charge in the DC case. I was just trying to keep it simple so the basic effect could be understood by All.

But as I stated before, the bright current going from the tube tip to the grounded wire is the sum of the current from the toroid to the tip and the current being picked up along the tube due to displacement currents.

To be rigorous, the sum of the currents could be a little unequal as the charge on the tip changes. The charge could vary some on the tip and thus the current sum could vary a little bit via Gausses law...

http://en.wikipedia.org/wiki/Gustav_Kirchhoff

http://en.wikipedia.org/wiki/Gauss%27s_law

Kirchhoff's circuit laws: This is a pair of rules (common in electrical engineering) to analyze electric circuits, which can be derived from Maxwell's equations.

http://en.wikipedia.org/wiki/Maxwell%27s_equations

Of course, common electrical engineering courses can be found on-line here:

http://ocw.mit.edu/OcwWeb/Electrical-Engineering-and-Computer-Science/index.htm#Undergraduate

6.002 Circuits and Electronics, Fall 2000

6.630 Electromagnetic Theory, Fall 2002

Cheers,

Terry

At 09:57 AM 7/5/2005, you wrote:
>Terry,
>
>Can you tell exactly where and how Kirchhoff's current law applies to this
>circuit?
>
>Stork
>
>>So far, the effect seems to be very simply Ampere's law with Maxwell's
>>displacement currents and Kirchhoff's current law here on page 6 of the
>>circuit theory book. I never could have spelled Kirchhoff myself ;-))
>>Cheers,
>>   Terry

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Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35517
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 13:12:40 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

At 10:38 PM 7/4/2005, you wrote:
>Hi Terry,
>..........
> >
> > Yes, it is easy to reproduce. If we can agree that just a
> > tube on Styrofoam will have "equal" sparks, I will spare our
> > atmosphere the mercury vapor release...
>
>If you are talking about breaking off the tube end, that isn't
>necessary. Any piece of aluminum on the end of the Styrofoam
>should have the same effect. I haven't tried the effect with a
>non-vacuum tube in between the topload and ground. But I have
>tried the effect with a tube that was not grounded. I got the
>same results whether the tube was grounded or not.

It is critical to my theory that just the broken tip without the tube will loose the effect since the added currents from the tube will then be gone. I will pick up the parts from the store in a little while.

>...........
>
>How do you explain the difference in color of the sparks? One is
>purple, the other is bright white. If there is just one
>manifestation of charge, shouldn't you be able to get a bright
>purple, or thin white spark?

In nitrogen, low level currents (cool) ionization is purple. Hot high current ionization appears white. Simply the different gas temperatures due to different currents.

>............
> >
> > It seems obvious from the photos that the top of the tube is
> > near the same potential as the top of the coil... That is
> > certainly just as expected from plain old field theory...
>
>I can't tell if we are talking about the same thing or not. Are
>you saying that it looks like the potential from the topload to
>the vacuum tube is the same from the vacuum tube to ground? What
>makes you say that?
>
>....
>.........
>
>It is interesting to me that it can be proven, at least visually

>so far, that there are indeed two distinct manifestations of
>charge, which matches the quantities derived from the empirical
>data.

You mean that the different looking sparks show "two distinct manifestations of charge"!! there are all kinds of sparks that look very different. Arc welder, lightning, Tesla coil sparks... A high voltage power supply with variable current shows many. Air at low pressure shows the colors (purple to white) much more easily. But, I think it is the same old boring "one" charge...

>Dave

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Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35520
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 16:09:27 -0600 (MDT)

<x-flowed>
Original poster: "Paul B. Brodie" <pbbrodie@bellsouth.net>

Jim,
Your last statement doesn't make any sense to me. I realize that reactance is an AC phenomenon but you say resistance is a DC phenomenon. Surely you aren't suggesting that resistance doesn't apply to AC?
Paul
Think Positive

----- Original Message -----
From: "Tesla list" <tesla@pupman.com>
To: <tesla@pupman.com>
Sent: Tuesday, July 05, 2005 1:57 PM
Subject: RE: Terry's Test - Two Manifestations of Charge

> Original poster: Jim Lux <jimlux@earthlink.net> >
> At 07:33 PM 7/4/2005, Tesla list wrote: >>Original poster: "David Thomson" <dwt@volantis.org> >>
>>
>>I have another problem with your hypothesis. According to >>Kirchhoff's law, the current going in is equal to the current >>going out.
>
> Kirchoff's laws apply to DC (or steady state AC) circuits with conductors, > that is, with discrete points and nodes. It's not entirely clear that you > could apply them to regions of space (although, fundamentally, that's what > FDTD type models do). Kirchoff also isn't so easy to apply to cases where > the propagation speed of the wave is important (i.e. transmission lines) >
>

>> According to Ohm's law the current is going to take >>the path of least resistance.
>
> Not precisely.. the current will distribute in inverse proportion to the > resistance. And, again, when you start talking about time varying fields > with some significant physical extent, "resistance", which is a DC > phenomenon, doesn't tell the whole story.
>
>
>

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 15:37:58 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35521
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 16:09:28 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi,

At 12:31 PM 7/5/2005, you wrote:
>Jim,
>Your last statement doesn't make any sense to me. I realize that reactance
>is an AC phenomenon but you say resistance is a DC phenomenon. Surely you
>aren't suggesting that resistance doesn't apply to AC?
>Paul
>Think Positive
>

In the AC case, "reactance" is the proper term. Reactance takes into account the leading and lagging currents. "Impedance" is another generally used for situations where things are not nice steady sine waves.

I think Jim knows that resistance (pure) can apply to AC too :o)))

Cheers,

Terry

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 16:06:56 -0600

To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35522
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 16:09:30 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

At 10:38 PM 7/4/2005, you wrote:
>Hi Terry,
>
>.............
> >
> > Yes, it is easy to reproduce. If we can agree that just a
> > tube on Styrofoam will have "equal" sparks, I will spare our
> > atmosphere the mercury vapor release...
>
>If you are talking about breaking off the tube end, that isn't
>necessary. Any piece of aluminum on the end of the Styrofoam
>should have the same effect. I haven't tried the effect with a
>non-vacuum tube in between the topload and ground. But I have
>tried the effect with a tube that was not grounded. I got the
>same results whether the tube was grounded or not.
....

I tried the end of a tube on Styrofoam this afternoon:

http://hot-streamer.com/temp/DaveTest-10.jpg

http://hot-streamer.com/temp/DaveTest-11.jpg

The spark from the toroid to the tube end and from the tube end to the ground wire are now exactly the same.

 From the diagram at:

http://hot-streamer.com/temp/DaveTest.gif

The i2 currents are now gone since the Styrofoam is very none conductive. It certainly appears to me that the difference in spark appearance seen before is just do to displacement currents being picked up by the partially conductive tube and adding to the i3 current making that spark brighter as seen before.

http://hot-streamer.com/temp/DaveTest-02.jpg

http://hot-streamer.com/temp/DaveTest-04.jpg

In DaveTest-02 you can see the significant i2 currents lighting the florescent tube and how the current increases toward the top.

So, I see nothing unusual that field and circuit theories (the old ones) would not easily explain. The tests seem to work just as expected. When one first sees the

effect, it seems strange. But a little investigation easily explains it.

Cheers,

Terry

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 16:14:53 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35524
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 16:21:58 -0600 (MDT)

<x-flowed>
Original poster: "Paul B. Brodie" <pbbrodie@bellsouth.net>

I'm sorry but I'm not an "old man," my degree is in Computer Science and Management, most of my physics and electronics knowledge is self taught, and I'm relatively new to the TCML, so I'm not a list old-timer. I do know that I picked up a good bit of knowledge about the scientific method along the way.

I am having a great deal of trouble with statements like, "the different appearance of the two arcs proves my new theory." I don't see how such a loosely put together experiment with absolutely no way to measure and record empirical data and what you describe that you visually observe as the appearance of "different sparks" proves anything at all. One problem, I consider to be a major one, that I see in the way this "experiment" is carried out is that there is no control over the atmosphere in which the sparks are created, along with absolutely no other forms of controls. benchmarks, or standards for comparison. It is so loosely thrown together that I would hardly categorize it as an experiment. I'm sorry if that offends you but it is my honest opinion without intending to disparage your attempts at trying to learn something and prove your ideas. I just think that any experiments performed to attempt to prove anything should follow some pretty well laid out, rigorous, and proven experimental methodologies.
Regards.
Paul
Think Positive

----- Original Message -----
From: "Tesla list" <<mailto:tesla@pupman.com>tesla@pupman.com> To:
<<mailto:tesla@pupman.com>tesla@pupman.com> Sent: Tuesday, July 05, 2005 3:12 PM
Subject: RE: Terry's Test - Two Manifestations of Charge

 > Original poster: Terry Fritz
<<mailto:teslalist@twfpowerelectronics.com>teslalist@twfpowerelectronics.com> >
 > Hi Dave,

>
> At 10:38 PM 7/4/2005, you wrote:
>>Hi Terry,
>>.....
>> >
>> > Yes, it is easy to reproduce. If we can agree that just a >> > tube on Styrofoam will have "equal" sparks, I will spare our >> > atmosphere the mercury vapor release...
>>
>>If you are talking about breaking off the tube end, that isn't >>necessary. Any piece of aluminum on the end of the Styrofoam >>should have the same effect. I haven't tried the effect with a >>non-vacuum tube in between the topload and ground. But I have >>tried the effect with a tube that was not grounded. I got the >>same results whether the tube was grounded or not.
>
> It is critical to my theory that just the broken tip without the tube will > loose the effect since the added currents from the tube will then be > gone. I will pick up the parts from the store in a little while.
>
>>.....
>>
>>How do you explain the difference in color of the sparks? One is >>purple, the other is bright white. If there is just one >>manifestation of charge, shouldn't you be able to get a bright >>purple, or thin white spark?
>
> In nitrogen, low level currents (cool) ionization is purple. Hot high > current ionization appears white. Simply the different gas temperatures > due to different currents.
>
>>.....
>> >
>> > It seems obvious from the photos that the top of the tube is >> > near the same potential as the top of the coil... That is >> > certainly just as expected from plain old field theory...
>>
>>I can't tell if we are talking about the same thing or not. Are >>you saying that it looks like the potential from the topload to >>the vacuum tube is the same from the vacuum tube to ground? What >>makes you say that?
>>
>>....
>>.....
>>
>>It is interesting to me that it can be proven, at least visually >>so far, that there are indeed two distinct manifestations of >>charge, which matches the quantities derived from the empirical >>data.
>
> You mean that the different looking sparks show "two distinct manifestations of
> charge"!! there are all kinds of sparks that look very different. Arc > welder, lightning, Tesla coil sparks... A high voltage power supply with > variable current shows many. Air at low pressure shows the colors (purple > to white) much more easily. But, I think it is the same old boring "one" > charge...
>
>
>>Dave
>
>
>

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 16:30:51 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35525
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 16:31:56 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi,

At 01:27 PM 7/5/2005, you wrote:
>I'm sorry but I'm not an "old man," my degree is in Computer Science and
>Management, most of my physics and electronics knowledge is self taught,
>and I'm relatively new to the TCML, so I'm not a list old-timer. I do know
>that I picked up a good bit of knowledge about the scientific method along
>the way.
>
>I am having a great deal of trouble with statements like, "the different
>appearance of the two arcs proves my new theory." I don't see how such a
>loosely put together experiment with absolutely no way to measure and
>record empirical data and what you describe that you visually observe as
>the appearance of "different sparks" proves anything at all. One problem,
>I consider to be a major one, that I see in the way this "experiment" is
>carried out is that there is no control over the atmosphere in which the
>sparks are created, along with absolutely no other forms of controls.
>benchmarks, or standards for comparison. It is so loosely thrown together
>that I would hardly categorize it as an experiment. I'm sorry if that
>offends you but it is my honest opinion without intending to disparage
>your attempts at trying to learn something and prove your ideas. I just
>think that any experiments performed to attempt to prove anything should
>follow some pretty well laid out, rigorous, and proven experimental
>methodologies. Regards.
>Paul
>Think Positive
>
>
.....

I don't think this testing is about anything terribly rigorous... Dave just presented a nice picture of something he saw and ask if it could be reproduced. It can... And "my" test was probably far more sloppy than Dave's ;-))

As for proving any theories... It "seems consistent" with all those old ones, I am not sure about the new ones.... I gave some links before to the usual circuit and field theory stuff and Dave has several big sites with his stuff, so the theories can be explained there... We were just more interested in the "real" brass tacks testing here without "arguing" too much theory...   Especially without the "arguing" ;-)))

Cheers,

Terry

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:53:27 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35526
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:57:36 -0600 (MDT)

<x-flowed>
Original poster: dave pierson <davep@quik.com>

Tesla list wrote:

>Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>
>
>Hi,
>
>At 12:31 PM 7/5/2005, you wrote:
>
>>Jim,
>>Your last statement doesn't make any sense to me. I realize that
>>reactance is an AC phenomenon but you say resistance is a DC phenomenon.
>>Surely you aren't suggesting that resistance doesn't apply to AC?
>>Paul
>>Think Positive
>In the AC case, "reactance" is the proper term.

    For parts of 'it'
    The pure 90 degree parts.

>   Reactance takes into account the leading and lagging currents.

    cf as above.

>   "Impedance" is another generally used for situations where things are
> not nice steady sine waves.

    Impedance, in normal usage is the vector sum of the reactance and the
     resistance, It applies to sine waves, and any sort of
    'waveshape'

    (It may be worth mentiong that inductoprs and capacitors are,
    at best, impure 'reactance' the capacitors come pretty close).
    Inductors all have some, sometimes substantial, resitance.)

    best

dwp

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:54:17 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35528
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:57:49 -0600 (MDT)

<x-flowed>
Original poster: Jim Lux <jimlux@earthlink.net>

At 10:57 AM 7/5/2005, Tesla list wrote:
>Original poster: "David Thomson" <dwt@volantis.org>
>
>Hi Terry,
>
>
> > >Let me put it this way, if there is just one form of charge,
>then there
> > >would be just one color and thickness of spark, but of varying
>
> > >intensity.

Not necessarily. The light from a spark comes from two sources: 1) thermal incandescence, which is fairly broad spectrum, and would probably appear white (corresponding to a temperature of around 6000K-7000K); 2) ionization of the air, where you see the emission spectra of nitrogen and oxygen, which would, I think, appear purple.

It would be trivial to tell with a spectroscope, since one will have a classic black-body type spectrum, and the other will have lines. The line spectra will be slightly broadened from the thermal effects too (this is one way measure the temperature of various parts of the spark channel)

I think the phenomenology is all covered fairly well in Cobine's book "Gaseous Conductors".

> >
> > ??? I don't get that... Looks like just simple basic field
> > theory stuff to me... I see nothing that is not explained
> > easily and perfectly well by the 150 - 200 year old laws of
> > electricity as told by Ampere, Maxwell, and Kirchhoff in the
> > early to mid 1800's...
>
>How do you explain the difference in color of the sparks? One is

>purple, the other is bright white. If there is just one
>manifestation of charge, shouldn't you be able to get a bright
>purple, or thin white spark?

Not necessarily. If you have enough energy to get the bright purple, you'll probably heat the air enough to get the thermal emission spectrum.

>The fact that there could be electrons between a high potential
>and low potential and manifesting in two very different modes
>seems not to be explained by the above laws. I don't see
>anything in those equations that would suggest such physical
>appearances. Yet, you see the different modes for yourself.
>
> > >Do you think you can measure the potential and current of
>those
> > >individual sparks?

Certainly. It's been done before. It's not easy. What you'd really want is time synchronized spectroscopy too, to look at the ionization and thermal state of the spark. Bazelyan and Raizer have some streak camera results along those lines in their book. I believe the book by Loeb and Meek on Long Air Sparks also has measurements and analysis. This work was done back in the 20s and 30s, but should be applicable. They didn't have the advantage of fast waveform recorders like we do now, though.

> > You really should do it on a 3-D simulator, but nobody here
> > has the super computer to handle that stuff... Some like
> > E-Tesla could fake that and work, but not easily in this
>case...
>
>I think we should not calculate the answers, but measure them.
>Once we have actual measurements, then we can verify whether the
>present equations calculate the data or not. Also, unless there
>is some way to prove that both the sparks have the same
>characteristics, we need to understand why the different
>appearances.

This sort of distinction is the difference between the classic hypothesis, experiment style of science and observational science. Both work.

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Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:54:55 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35529
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:57:55 -0600 (MDT)

<x-flowed>

Original poster: "Antonio Carlos M. de Queiroz" <acmdq@uol.com.br>

Tesla list wrote:

>Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>
>Hi Dave and All,
>I got the DRSSTC fixed this afternoon and tried to reproduce Dave's
>unequal spark test.
>http://www.tesla-coil-builder.com/images/chiron01twosparks.jpg

I tried to reproduce the same experiment using an electrostatic machine. It worked. And the explanation is trivial.
I placed a fluorescent tube over a metal plate (30x30 cm), over an insulating support, and placed the two pins at one end of the tube close to the two terminals of the machine. When the machine operates, a continuous stream of sparks flows between the two terminals and the two pins. Both identical due to the symmetry.
If I connect one of the terminals to the metal plate in contact with the tube, the tube starts to glow and the sparks at that side are clearly more intense.
The reason is simple: The tube over the plate is acting as a capacitor, charged by the weak sparks. It discharges periodically with an intense spark between the other pin and the terminal connected to the plate, that is the outer plate of the capacitor.
(I observed that I can obtain a more intense effect if I made the connection between the metal plate and the machine terminal through a Leyden jar. The jar gets charged through the leakage across the surface of the glass tube, and the sparks are longer.) Using a Tesla coil, the mechanism may be essentially the same, specially if someone is holding the tube.
I will try to take a picture tomorrow.

Antonio Carlos M. de Queiroz

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:55:27 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35532
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:58:05 -0600 (MDT)

<x-flowed>
Original poster: "Mark Broker" <mbroker@thegeekgroup.org>

On Tue, 05 Jul 2005 12:57:04 -0500, Tesla list <tesla@pupman.com> wrote:

>Original poster: "David Thomson" <dwt@volantis.org>

>How do you explain the difference in color of the sparks? One is
>purple, the other is bright white. If there is just one

>manifestation of charge, shouldn't you be able to get a bright
>purple, or thin white spark?

An imperfect conductor that carries more current will be hotter than the same imperfect conductor that carries less current. The color of the radiated light follows the blackbody radiation theory and Wein's Law:

http://en.wikipedia.org/wiki/Black_body http://en.wikipedia.org/wiki/Wien's_law

>The fact that there could be electrons between a high potential
>and low potential and manifesting in two very different modes
>seems not to be explained by the above laws. I don't see
>anything in those equations that would suggest such physical
>appearances. Yet, you see the different modes for yourself.

I think I just explained, albeit the highly abridged version, above, using priciples established in the late 1800s.

> > It seems obvious from the photos that the top of the tube is
> > near the same potential as the top of the coil... That is
> > certainly just as expected from plain old field theory...
>
>I can't tell if we are talking about the same thing or not. Are
>you saying that it looks like the potential from the topload to
>the vacuum tube is the same from the vacuum tube to ground? What
>makes you say that?

The potential of the tube is closer to the potential of the topload than to ground. And that's what one would expect due to capacitive coupling and field theory....

> > It is sort of a neat way to demonstrate field effects....
> > But I really honestly see zero "new" theory to any of it :-|
>
>That's true. The "new" theory I am talking about is really the
>old Aether theory, but based upon modern measurements.

Didn't Michelson and Morley disprove the aether theory pretty thoroughly?
http://en.wikipedia.org/wiki/Michelson-Morley_experiment

>The fact is, in order for something to have an effect, it must be
>real. In the modern interpretation of EM theory, the field is
>just a mathematical construct.

I can show that a magnetic field is "real" with some iron filings, and the gravitational field certainly feels real enough....

In Maxwell's time, it was the
>Aether. What my theory shows is that Maxwell was right about the
>Aether.

See Michelson and Morley above.

>It is interesting to me that it can be proven, at least visually
>so far, that there are indeed two distinct manifestations of
>charge, which matches the quantities derived from the empirical
>data.

All that we have proven, visually speaking, is that one spark has more current than the other. I don't see how this even demonstrates that there are two distinct manifestations of charge, let alone proves it.

Regards,

Mark Broker
The Geek Group

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:55:44 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35531
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:58:05 -0600 (MDT)

<x-flowed>
Original poster: Jim Lux <jimlux@earthlink.net>

At 02:32 PM 7/5/2005, Tesla list wrote:
>Original poster: "Paul B. Brodie" <pbbrodie@bellsouth.net>
>
>Jim,
>Your last statement doesn't make any sense to me. I realize that reactance
>is an AC phenomenon but you say resistance is a DC phenomenon. Surely you
>aren't suggesting that resistance doesn't apply to AC?
>Paul
>Think Positive

Resistance is DC (as in E= I * R) . For AC, you need to talk impedance, which has a resistive and a reactive component; as in E = I * Z or I * (R + j X). And for AC, of non trivial, or non steady state single frequency systems, you need to worry about physical displacements, too.

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com

X-Sender: teslalist@twfpowerelectronics.com
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Date: Tue, 05 Jul 2005 18:56:06 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35527
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:57:41 -0600 (MDT)

<x-flowed>
Original poster: Jim Lux <jimlux@earthlink.net>

At 02:37 PM 7/5/2005, Tesla list wrote:
>Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>
>
>Hi,
>
>At 12:31 PM 7/5/2005, you wrote:
>>Jim,
>>Your last statement doesn't make any sense to me. I realize that
>>reactance is an AC phenomenon but you say resistance is a DC phenomenon.
>>Surely you aren't suggesting that resistance doesn't apply to AC?
>>Paul
>>Think Positive
>
>In the AC case, "reactance" is the proper term. Reactance takes into
>account the leading and lagging currents. "Impedance" is another
>generally used for situations where things are not nice steady sine waves.
Reactance is the imaginary part of the impedance. You'd use impedance for steady state systems in general. Transients might be another story (if only because most "real" components do not have constant impedance over frequency)

>I think Jim knows that resistance (pure) can apply to AC too :o))) Probably..
After the last few days developing analyses and writing up measurement uncertainties for phase measurement in an RF system, I'm starting to disbelieve the practical existence of any pure anything. <grin> Back to batteries, knife switches, and lightbulbs for me!

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:56:21 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35530
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com

Resent-Date: Tue, 5 Jul 2005 18:58:01 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

 > I don't think this testing is about anything terribly > rigorous... Dave just presented a nice picture of something > he saw and ask if it could be reproduced. It can... And > "my" test was probably far more sloppy than Dave's ;-)) >
 > As for proving any theories... It "seems consistent" with > all those old ones, I am not sure about the new ones.... I > gave some links before to the usual circuit and field theory > stuff and Dave has several big sites with his stuff, so the > theories can be explained there... We were just more > interested in the "real" brass tacks testing here without > "arguing" too
 > much theory...   Especially without the "arguing" ;-)))

Exactly. We only want to see if the effect can be reproduced and under what circumstances. This is about experimenting and collecting data, not drawing conclusions.

Dave

</x-flowed>
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Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:56:47 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35533
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:58:17 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Terry,

 > The spark from the toroid to the tube end and from the tube > end to the ground wire are now exactly the same.

So we can agree that the tube did something to produce the effect.

 > In DaveTest-02 you can see the significant i2 currents > lighting the florescent tube and how the current increases > toward the top.

Before you break everything down, could you replace the tube with a similar rod of copper or aluminum? I'm wondering whether the displacement currents are peculiar to the gas tube or whether any conductor will pick them up.

Also, could you try both the tube and the rod with their opposite ends grounded?

Thanks,

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 18:57:11 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35534
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 18:58:17 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Paul,

 > I am having a great deal of trouble with statements like, > "the different appearance of the two arcs proves my new > theory."

If I said that, or something like that, then let me correct it.
The different appearance of the two arcs proves that electricity can have at least two different appearances. I happen to have a new theory that predicts two different manifestations of charge, which I developed as a result of the observation.

What we are doing here is not proving either my theory or Terry's, but replicating the experiment that led to the discussion. We are simply looking for facts in this discussion.

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 19:38:50 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35535
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 19:38:58 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

At 06:31 PM 7/5/2005, you wrote:
>.......
>
>Before you break everything down, could you replace the tube with
>a similar rod of copper or aluminum?

I picked a copper pipe up today too because I knew someone was going to ask that ;-)))

The copper pipe produced the effect just fine:

http://hot-streamer.com/temp/DaveTest-20.jpg

>I'm wondering whether the
>displacement currents are peculiar to the gas tube or whether any
>conductor will pick them up.

Any conductor or sort of conductor should work fine.

>Also, could you try both the tube and the rod with their opposite
>ends grounded?

I think grounding the copper rod is a trivial case ;-))

I tried the tube but it was far too conductive and just shorted the spark to ground:

http://hot-streamer.com/temp/DaveTest-21.jpg

I tried wrapping the foil on the outside but it still was too conductive:

http://hot-streamer.com/temp/DaveTest-22.jpg

Maybe if the tube were old and had a poor gas seal it would have enough resistance to work. If one were to hold it, that might provide enough resistance too. Since the DRSSTC packs over 300 joules, I didn't feel like trying it ;-)

Of course, if most of the current is i2 current with little of i1 helping:

http://hot-streamer.com/temp/DaveTest.gif

we can just remove the toroid to rod wire all together:

http://hot-streamer.com/temp/DaveTest-23.jpg

Now it is much more obvious what is going on. I had to turn the power down since it kept wanting to arc over, but it is easy to get it to where just the floating rod arcs to the ground wire.

Cheers,

Terry

>Thanks,
>

>Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 20:31:35 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35539
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 20:32:47 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Jim,

Thanks for the information on the spectroscopy analysis. I never know what
resources will come my way. If I get the chance, I'll follow up on this.

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Tue, 05 Jul 2005 20:31:43 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35540
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Tue, 5 Jul 2005 20:32:57 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Antonio,

 > I will try to take a picture tomorrow.

I look forward to your pictures. Your setup sounds interesting.

Dave

</x-flowed>

Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 01:11:16 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35547
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 01:13:45 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Mark,

> >How do you explain the difference in color of the sparks? One is
> >purple, the other is bright white. If there is just one > manifestation
> >of charge, shouldn't you be able to get a bright purple, or > thin white
> >spark?
>
> An imperfect conductor that carries more current will be > hotter than the same imperfect conductor that carries less > current. The color of the radiated light follows the > blackbody radiation theory and Wein's Law: >
> http://en.wikipedia.org/wiki/Black_body >
http://en.wikipedia.org/wiki/Wien's_law

>From the black body page: "So, as temperature increases, the glow color changes from red to yellow to white to blue."

Does this mean the thin purple spark is hotter than the thick white spark?

> > > It seems obvious from the photos that the top of the tube is
> > > near the same potential as the top of the coil... That is > > > certainly just as expected from plain old field theory...
> >
> >I can't tell if we are talking about the same thing or not.
Are
> >you saying that it looks like the potential from the topload to
> >the vacuum tube is the same from the vacuum tube to ground?
What
> >makes you say that?
>
> The potential of the tube is closer to the potential of the topload than to
> ground. And that's what one would expect due to capacitive coupling and
> field theory....

How do you think the potential from the tube to ground will compare to the potential between the topload and tube, given the tube is exactly in between? Would you predict that by changing the angle of the tube with respect to the coil that the physical appearance of the sparks will change?

> >That's true. The "new" theory I am talking about is really the
> >old Aether theory, but based upon modern measurements.
>

> Didn't Michelson and Morley disprove the aether theory pretty > thoroughly?
> http://en.wikipedia.org/wiki/Michelson-Morley_experiment

Actually, no. They proved that there is an Aether drift of ten thousand kilometers per second. This was verified in over 100,000 repetitions of the experiment over 20 years and culminated with Dayton Miller's work.

Dayton C. Miller, Science, New Series, Vol. 63, No. 1635 (Apr. 30, 1926), 433-443

Also, in 1966, Dieter Brill and Jeffrey Cohen changed the name from "Aether drift" to "frame dragging," and using a satellite, proved that it does exist. Nobody has yet observed a "frame," I might add, any more than anyone has observed a unit of Aether.
But it is accepted by mainstream science, nonetheless.

> >The fact is, in order for something to have an effect, it must be
> >real. In the modern interpretation of EM theory, the field is > >just a mathematical construct.
>
> I can show that a magnetic field is "real" with some iron filings, and the
> gravitational field certainly feels real enough....

Take it up with modern physics. It is the prevailing view in the peer reviewed journals that magnetic fields are not real, but just mathematical constructs. I happen to agree with you, and mathematically quantify the Aether as quantum units of rotating magnetic field. But somehow, I suspect you will now correct yourself and say that the "real" magnetic field is just an illusion of being real. :-)
Can't have an Aether.

> See Michelson and Morley above.

See Dayton Miller above.

> >It is interesting to me that it can be proven, at least visually
> >so far, that there are indeed two distinct manifestations of > >charge, which matches the quantities derived from the empirical
> >data.
>
> All that we have proven, visually speaking, is that one spark has more
> current than the other.

I must have missed something. Did someone take a measurement of the currents? As I understand it, the only thing that has been proven so far is that there are two different appearances. One of them is thin and purple, the other is thick and white. Check out the pictures to see what I'm talking about. We also know that the vacuum tube will produce this result and that a mere piece of metal between the topload and ground will not.

I understand that there are some theories and opinions as to what the observations mean, but as far as I understand it, nothing has been done to prove anything, yet.

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com

X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 01:13:06 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35548
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 01:13:47 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Terry,

 > The copper pipe produced the effect just fine: >
 > http://hot-streamer.com/temp/DaveTest-20.jpg

Interesting.

 > >I'm wondering whether the
 > >displacement currents are peculiar to the gas tube or whether any
 > >conductor will pick them up.
 >
 > Any conductor or sort of conductor should work fine.

That appears to be the case. Now we know that an extremely short conductor has no effect, and that a long conductor has a pronounced effect. Apparently the surface area of the conductor plays a role. This would indicate the conductor is acting as an antenna. Well, this opens a lot of door for further exploration.
I'll see if I can get my coil working again tomorrow.

 > >Also, could you try both the tube and the rod with their > opposite ends grounded?
 >
 > I think grounding the copper rod is a trivial case ;-))

Nothing is trivial. Sometimes things aren't what we expect. I remember a teacher wouldn't perform an experiment from a science book in the 9th grade. It involved holding a ping pong ball in an inverted funnel and blowing air down into the funnel and then releasing the ball. We had to predict what would happen. I predicted the ball would stay inside the funnel until the air stopped. The teacher said I was wrong and closed the book. I protested that the scientific method involved doing experiments, not guessing. He got snotty with me and tried to embarrass me in the class and told me to try it. I could tell he already had a half dozen one liners ready to go when the ball blew out the bottom. But I did the experiment and my intuition was right.
The air flowed around the ball and the resulting pressure kept the ball floating as long as the air was moving through the funnel neck. He then apologized and confessed that he ignored this experiment for the past three years because he thought it was stupid. Nothing is trivial.

 > I tried the tube but it was far too conductive and just > shorted the spark to ground:
 >
 > http://hot-streamer.com/temp/DaveTest-21.jpg >
 > I tried wrapping the foil on the outside but it still was too > conductive:

 >
 > http://hot-streamer.com/temp/DaveTest-22.jpg

Did you check to see if the bright white spark would manifest at the bottom of the tube if the same gap were present as at the top?

 > we can just remove the toroid to rod wire all together: >
 > http://hot-streamer.com/temp/DaveTest-23.jpg >
 > Now it is much more obvious what is going on. I had to turn > the power down since it kept wanting to arc over, but it is > easy to get it to where just the floating rod arcs to the ground wire.

Well, of course, we see this all the time when we touch objects in the room while the coil is operating.

Okay, you have a thin purple spark on the tube to ground side.
Can you capture a transition from thin purple to bright white, or does it change suddenly?

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 01:32:23 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35550
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 01:32:54 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

At 09:34 PM 7/5/2005, you wrote:
>Hi Terry,
>
> > The copper pipe produced the effect just fine:
> >
> > http://hot-streamer.com/temp/DaveTest-20.jpg
>
>Interesting.

I was sure it would.

> > >I'm wondering whether the
> > >displacement currents are peculiar to the gas tube or whether
>any
> > >conductor will pick them up.
> >

> > Any conductor or sort of conductor should work fine.
>
>That appears to be the case. Now we know that an extremely short
>conductor has no effect, and that a long conductor has a
>pronounced effect. Apparently the surface area of the conductor
>plays a role. This would indicate the conductor is acting as an
>antenna. Well, this opens a lot of door for further exploration.
>I'll see if I can get my coil working again tomorrow.

Great! Ok..

>
> > >Also, could you try both the tube and the rod with their
> > opposite ends grounded?
> >
> > I think grounding the copper rod is a trivial case ;-))
>
>Nothing is trivial. Sometimes things aren't what we expect. I
>remember a teacher wouldn't perform an experiment from a science
>book in the 9th grade. It involved holding a ping pong ball in
>an inverted funnel and blowing air down into the funnel and then
>releasing the ball. We had to predict what would happen. I
>predicted the ball would stay inside the funnel until the air
>stopped. The teacher said I was wrong and closed the book. I
>protested that the scientific method involved doing experiments,
>not guessing. He got snotty with me and tried to embarrass me in
>the class and told me to try it. I could tell he already had a
>half dozen one liners ready to go when the ball blew out the
>bottom. But I did the experiment and my intuition was right.
>The air flowed around the ball and the resulting pressure kept
>the ball floating as long as the air was moving through the
>funnel neck. He then apologized and confessed that he ignored
>this experiment for the past three years because he thought it
>was stupid. Nothing is trivial.

Ok.... I'll try it ;-)) But I will predict now that it will look like just an arc
to a grounded rod... I have done this one a thousand times ;-))

>.............
> > Now it is much more obvious what is going on. I had to turn
> > the power down since it kept wanting to arc over, but it is
> > easy to get it to where just the floating rod arcs to the
>ground wire.
>
>Well, of course, we see this all the time when we touch objects
>in the room while the coil is operating.
>
>Okay, you have a thin purple spark on the tube to ground side.
>Can you capture a transition from thin purple to bright white, or
>does it change suddenly?

Not sure what you mean there... When your coil is going, you can take over for
me...

In another post:
>Does this mean the thin purple spark is hotter than the thick
>white spark?

The sparks are dark purple to purple white then to white with increasing current...

I used to work on vacuum plasma systems. I just "loved" to see everything go purple which meant it was time to tear the whole mess down because air was leaking in...

>How do you think the potential from the tube to ground will
>compare to the potential between the topload and tube, given the
>tube is exactly in between? Would you predict that by changing
>the angle of the tube with respect to the coil that the physical
>appearance of the sparks will change?

It is hard to predict but I will try to make a rough guess in another post. The copper pipe makes things easier since it's voltage is uniform unlike the odd florescent tube.

> > All that we have proven, visually speaking, is that one spark
>has more
> > current than the other.
>
>I must have missed something. Did someone take a measurement of
>the currents?

I picked up some other things from the store too which "should" easily show the current differences ;-)) A method from John Couture that I have never tried... Stay tuned...

Cheers,

Terry

>Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 12:03:49 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35558
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 12:05:47 -0600 (MDT)

<x-flowed>
Original poster: Jim Lux <jimlux@earthlink.net>

At 12:11 AM 7/6/2005, Tesla list wrote:
>Original poster: "David Thomson" <dwt@volantis.org>
>
>Hi Mark,
>
> >
> > >spark?

> >
> > An imperfect conductor that carries more current will be
> > hotter than the same imperfect conductor that carries less
> > current. The color of the radiated light follows the
> > blackbody radiation theory and Wein's Law:
> >
> > http://en.wikipedia.org/wiki/Black_body
> > http://en.wikipedia.org/wiki/Wien's_law
>
> >From the black body page: "So, as temperature increases, the glow
>color changes from red to yellow to white to blue."
>
>Does this mean the thin purple spark is hotter than the thick
>white spark?

No.. I think the thin purple spark is just ionized nitrogen, so you're seeing an emission line from the nitrogen. The white spark is a blackbody radiator, and follows Wien's law.

The temperature of air sparks is fairly well understood to be around 6000K (based on the thermodynamics and energy balance).

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 14:55:03 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35565
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 14:55:18 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

At 09:34 PM 7/5/2005, you wrote:
>.....
>
> > >Also, could you try both the tube and the rod with their
> > >opposite ends grounded?
> >
> > I think grounding the copper rod is a trivial case ;-))
>
>Nothing is trivial. Sometimes things aren't what we expect. I
>remember a teacher wouldn't perform an experiment from a science
>book in the 9th grade. It involved holding a ping pong ball in
>an inverted funnel and blowing air down into the funnel and then
>releasing the ball. We had to predict what would happen. I

>predicted the ball would stay inside the funnel until the air
>stopped. The teacher said I was wrong and closed the book. I
>protested that the scientific method involved doing experiments,
>not guessing. He got snotty with me and tried to embarrass me in
>the class and told me to try it. I could tell he already had a
>half dozen one liners ready to go when the ball blew out the
>bottom. But I did the experiment and my intuition was right.
>The air flowed around the ball and the resulting pressure kept
>the ball floating as long as the air was moving through the
>funnel neck. He then apologized and confessed that he ignored
>this experiment for the past three years because he thought it
>was stupid. Nothing is trivial.

It just arcs to the near ground rod now....

http://hot-streamer.com/temp/DaveTest-30.jpg

> > All that we have proven, visually speaking, is that one spark
>has more
> > current than the other.
>
>I must have missed something. Did someone take a measurement of
>the currents? As I understand it, the only thing that has been
>proven so far is that there are two different appearances. One
>of them is thin and purple, the other is thick and white. Check
>out the pictures to see what I'm talking about. We also know
>that the vacuum tube will produce this result and that a mere
>piece of metal between the topload and ground will not.

I simply place little light bulbs in the current paths... Mine were 100mA but you probably want 50mA types from Radio Shack.

http://hot-streamer.com/temp/DaveTest-31.jpg

The light bulbs will be a rough current indicator. John Corture describes this test in his books. One can make a fiber optic link to a bulb and calibrate it for a nice RMS HV current sensor, but that is more than I wanted to fiddle with...
This is what I found:

http://hot-streamer.com/temp/DaveTest-32.jpg

The light bulb from the toroid to the copper pipe was dimmer than the light bulb between the pipe and ground. The spark from the toroid to the pipe was also dimmer that the spark between the pipe and the ground wire.

Thus, it appears that the dim spark has less current than the bright spark.

Cheers,

Terry

</x-flowed>

Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 17:43:44 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35574
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 17:44:37 -0600 (MDT)

<x-flowed>
Original poster: "Antonio Carlos M. de Queiroz" <acmdq@uol.com.br>

Tesla list wrote:
>Original poster: "David Thomson" <dwt@volantis.org>
>Hi Antonio,
> > I will try to take a picture tomorrow.
>I look forward to your pictures. Your setup sounds interesting.

The setup: http://www.coe.ufrj.br/~acmq/tesla/2sparks4.jpg Running:
http://www.coe.ufrj.br/~acmq/tesla/2sparks2.jpg Sparks and light in the tube:
http://www.coe.ufrj.br/~acmq/tesla/2sparks3.jpg Detail:
http://www.coe.ufrj.br/~acmq/tesla/2sparks1.jpg The average current is about 50 uA.

Antonio Carlos M. de Queiroz

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 23:13:20 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35586
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 23:14:01 -0600 (MDT)

<x-flowed>
Original poster: "Mark Broker" <mbroker@thegeekgroup.org>

On Wed, 06 Jul 2005 02:11:16 -0500, Tesla list <tesla@pupman.com> wrote:

>Original poster: "David Thomson" <dwt@volantis.org>

> >From the black body page: "So, as temperature increases, the glow
>color changes from red to yellow to white to blue."
>

>Does this mean the thin purple spark is hotter than the thick
>white spark?

The spark is "redder," ergo cooler. But I pretty much agree with Jim (see his responses).

>How do you think the potential from the tube to ground will
>compare to the potential between the topload and tube, given the
>tube is exactly in between? Would you predict that by changing
>the angle of the tube with respect to the coil that the physical
>appearance of the sparks will change?

I expect the tube will have more than half the potential of the topload when placed in the middle as shown by you and Terry. Adjusting the angle of the tube/rod I expect would make the sparks more even in appearance as the coupling between the TC and the conductive rod decreases.

I'd love to be able to test this in Etesla, just for grins, but it uses cylindrical symmetry and cannot simulate a conductive rod next to the coil as in these experiments. A 3D version of ETesla was on my TODO list about 4 years ago, but it quickly fell off the list because it required too much effort and computer horsepower for too little gain.

> > Didn't Michelson and Morley disprove the aether theory pretty
> > thoroughly?
> > http://en.wikipedia.org/wiki/Michelson-Morley_experiment
>
>Actually, no. They proved that there is an Aether drift of ten
>thousand kilometers per second. This was verified in over
>100,000 repetitions of the experiment over 20 years and
>culminated with Dayton Miller's work.

Niels Bohr decided that the sheer number of "null results" is indicative of disproving the theory, which, right or wrong, apparently has resulted in people apotheosizing (your word of the day :)) his remark.

Perhaps it would be best to call "the aether" something else - dark energy, or perhaps the Higgs Field - "aether" seems to conjure too much acrimony these days.

>Also, in 1966, Dieter Brill and Jeffrey Cohen changed the name
>from "Aether drift" to "frame dragging," and using a satellite,
>proved that it does exist.

AFAIK frame dragging hasn't been "proven" yet, despite the evidenciary support from the two LAGEOS satellites.

Reading up on stuff like this the primary reason why my TODO list never seems to get any shorter. :p

> > >It is interesting to me that it can be proven, at least
>visually
> > >so far, that there are indeed two distinct manifestations of
> > >charge, which matches the quantities derived from the
>empirical
> > >data.

> >
> > All that we have proven, visually speaking, is that one spark
>has more
> > current than the other.
>
>I must have missed something.

You said, "It is interesting to me that it can be proven, at least visually so far, that there are indeed two distinct manifestations of charge...."

No, these experiments do not "prove" that, which is what I stated earlier. Nor was there "absolute proof" that one spark has more current than the other: I mispoke earlier when I used the "P word." What I meant to say is that one spark appears to be carrying more current than the other, a statement which is based off decades of research on spark discharges.

We also know
>that the vacuum tube will produce this result and that a mere
>piece of metal between the topload and ground will not.
>
>I understand that there are some theories and opinions as to what
>the observations mean, but as far as I understand it, nothing has
>been done to prove anything, yet.

Now we know that the brighter spark carries more current and a metal pipe has the same effect as the flourescent tube, thanks to Terry.

I think that the topics of aether/frame dragging/dark energy/etc are so far off the topic of Tesla Coils that further onlist discussion should be altogether discontinued....

Cheers!

Mark Broker
The Geek Group

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Wed, 06 Jul 2005 23:38:34 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35587
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Wed, 6 Jul 2005 23:38:37 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Mark,

At 11:08 PM 7/6/2005, you wrote:
.....

>>How do you think the potential from the tube to ground will
>>compare to the potential between the topload and tube, given the
>>tube is exactly in between? Would you predict that by changing
>>the angle of the tube with respect to the coil that the physical
>>appearance of the sparks will change?
>
>I expect the tube will have more than half the potential of the topload
>when placed in the middle as shown by you and Terry. Adjusting the angle
>of the tube/rod I expect would make the sparks more even in appearance as
>the coupling between the TC and the conductive rod decreases.

I got about 1/2 the voltage too. But it is really a "current thing"... Hard to guess at even with help from the present programs...

>I'd love to be able to test this in Etesla, just for grins, but it uses
>cylindrical symmetry and cannot simulate a conductive rod next to the coil
>as in these experiments. A 3D version of ETesla was on my TODO list about
>4 years ago, but it quickly fell off the list because it required too much
>effort and computer horsepower for too little gain.

I can run a 500 x 500 grid in about 45 minutes on a 3 GHz machine. It is hyperthreading so it still has about twice that available if it could be done in two threads... I was at the robot meeting tonight and they said just to run two things after Main().... I did not get it 0:-|... But "real" programmers would... So that would be 45 minutes times say 250 = 8 days for 500 x 500 x 500 cube... That is a "very" detailed array in a realistic amount of time... So maybe we have to start thinking about a true "3D" version of E-Tesla... But on the other hand... Almost all coils are served by the present version..... But a streamer off the toroid would need 3-D..... Would have to redo all the physical object constraints to 3-D...

>> > Didn't Michelson and Morley disprove the aether theory pretty
>> > thoroughly?
>> > http://en.wikipedia.org/wiki/Michelson-Morley_experiment
>>
>>Actually, no. They proved that there is an Aether drift of ten
>>thousand kilometers per second. This was verified in over
>>100,000 repetitions of the experiment over 20 years and
>>culminated with Dayton Miller's work.
>
>Niels Bohr decided that the sheer number of "null results" is indicative
>of disproving the theory, which, right or wrong, apparently has resulted
>in people apotheosizing (your word of the day :)) his remark.
>
>Perhaps it would be best to call "the aether" something else - dark
>energy, or perhaps the Higgs Field - "aether" seems to conjure too much
>acrimony these days.

"In 1979 the Brillet-Hall experiment put an upper limit of 30 m/s for any one direction, but reduced this to only 0.000001 m/s for a two-direction case (ie, still or partially entrained aether). A year long repeat known as Hils and Hall,

published in 1990, reduced this to 2x10-13 m/s . "

It seems to be on a "box cart headed to the hot place" towards "ZERO" ;-))

.....

>>I understand that there are some theories and opinions as to what
>>the observations mean, but as far as I understand it, nothing has
>>been done to prove anything, yet.
>
>
>Now we know that the brighter spark carries more current and a metal pipe
>has the same effect as the flourescent tube, thanks to Terry.
>
>
>I think that the topics of aether/frame dragging/dark energy/etc are so
>far off the topic of Tesla Coils that further onlist discussion should be
>altogether discontinued....\

Agreed!!!!!!!!!!!!!

Cheers,

Terry

>Cheers!
>
>Mark Broker
>The Geek Group

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 11:00:31 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35596
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 11:04:30 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Mark,

 > "aether" seems to conjure too much acrimony these days.

Yes, it does. But the effect is purely psychological. The data doesn't care what
it is called.

> What I meant
> to say is that one spark appears to be carrying more current than the
> other, a statement which is based off decades of research on > spark discharges.

That's interesting. That is exactly what I hypothesize, too. In fact, the two types of charge I have quantified show that electrons align along electrostatic dipoles in the "vacuum" when the potential is high and the current is low, and they align along electromagnetic dipoles in the "vacuum" when the potential is low and the current is high. My theory also shows that as electrons migrate en masse to the topload, their potential increases and current decrease, and when they migrate en masse to the ground the potential decreases and the current increases. In other words, there is an orthogonal phase change in the overall "shape" of the group of electrons.

When I first noticed what appeared to me as two distinct manifestations of charge, I wondered if this effect could be quantified. It quantifies nicely, not only numerically and in units, but also geometrically. It is possible to easily model the electron behavior with values and units and in space-time with this system. The model essentially looks like a bunch of moving Lego blocks. You can actually visualize the physical qualities of the electrons.

It really doesn't bother me that others would rather choose to keep the system they have for modeling coil behavior, and I'm not going to do anything to upset the cart. However, whether people decide to use the present system or my system, both are established on the same data. These experiments are very useful for me. To begin with, I'm glad to see that others can produce the same effect, even if they have a different interpretation of what they think causes the effect. I'm learning a lot from you guys and I'm very grateful for it.

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
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X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 11:01:12 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35597
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 11:04:29 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Terry,

> I simply place little light bulbs in the current paths...
> Mine were 100mA but you probably want 50mA types from Radio Shack.
>
> http://hot-streamer.com/temp/DaveTest-31.jpg >

> The light bulbs will be a rough current indicator. John > Corture describes this test in his books. One can make a > fiber optic link to a bulb and calibrate it for a nice RMS HV > current sensor, but that is more than I wanted to fiddle > with... This is what I found:
>
> http://hot-streamer.com/temp/DaveTest-32.jpg >
> The light bulb from the toroid to the copper pipe was dimmer > than the light bulb between the pipe and ground. The spark > from the toroid to the pipe was also dimmer that the spark > between the pipe and the ground wire.
>
> Thus, it appears that the dim spark has less current than the > bright spark.

Excellent, thanks for the great information. I've got a bunch of small bulbs. I'll see if they have a rating on them. Is there a similar way to test for potential? I would like to eventually determine whether there is more power between the tube and ground than there is between the tube and topload.

In other words, is the tube acting like a transformer or an antenna? We could guess on it, but I would like to know for sure.

Also, the bright white spark is apparently radiating more photons than the thin purple spark. Is this extra energy radiation accounted for in the current measurement? It would seem to me that the photon radiation is in addition to the current.

Dave

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 11:01:37 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35592
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 11:04:09 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Antonio,

> The setup: http://www.coe.ufrj.br/~acmq/tesla/2sparks4.jpg > Running: http://www.coe.ufrj.br/~acmq/tesla/2sparks2.jpg > Sparks and light in the tube:
> http://www.coe.ufrj.br/~acmq/tesla/2sparks3.jpg > Detail: http://www.coe.ufrj.br/~acmq/tesla/2sparks1.jpg > The average current is about 50 uA.

That's a really neat setup.

> I tried to reproduce the same experiment using an > electrostatic machine. It worked. And the explanation is trivial.
> I placed a fluorescent tube over a metal plate (30x30 cm), > over an insulating support, and placed the two pins at one > end of the tube close to the two terminals of the machine.
> When the machine operates, a continuous stream of sparks > flows between the two terminals and the two pins. Both > identical due to the symmetry.
> If I connect one of the terminals to the metal plate in > contact with the tube, the tube starts to glow and the sparks > at that side are clearly more intense.
> The reason is simple: The tube over the plate is acting as a > capacitor, charged by the weak sparks. It discharges > periodically with an intense spark between the other pin and > the terminal connected to the plate, that is the outer plate > of the capacitor.
> (I observed that I can obtain a more intense effect if I made > the connection between the metal plate and the machine > terminal through a Leyden jar. The jar gets charged through > the leakage across the surface of the glass tube, and the > sparks are longer.)

This is very interesting. The tube and plate are acting like a capacitor. That makes sense. But wouldn't the capacitor act as a transformer and reduce the potential in order to increase the current? In other words, the thinner spark would be higher potential, lower current. The thicker and brighter spark would be lower potential, higher current. The total power in each spark would be the same, correct?

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 12:14:16 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35601
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 12:14:27 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

.....

>Excellent, thanks for the great information. I've got a bunch of
>small bulbs. I'll see if they have a rating on them. Is there a
>similar way to test for potential? I would like to eventually
>determine whether there is more power between the tube and ground
>than there is between the tube and topload.

A ball gap voltmeter, but they might not work well at all under AC conditions. Probably need a high voltage stack probe with a shielded body. The voltage is not

terribly high in this case. Ross sells them, or you could make one for vastly less money. I think the copper rod would be ok with a little loading from such a probe.

>Also, the bright white spark is apparently radiating more photons
>than the thin purple spark. Is this extra energy radiation
>accounted for in the current measurement? It would seem to me
>that the photon radiation is in addition to the current.

The camera (me) did not take that good of picture. Best to set it up yourself so you can see it first hand. I did not see anything out of the ordinary.

Cheers,

Terry

</x-flowed>
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X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 16:05:39 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35607
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 16:11:03 -0600 (MDT)

<x-flowed>
Original poster: "Malcolm Watts" <m.j.watts@massey.ac.nz>

Hi Dave,

On 7 Jul 2005, at 11:01, Tesla list wrote:

> Original poster: "David Thomson" <dwt@volantis.org> >
> Hi Antonio,
>
> > The setup: http://www.coe.ufrj.br/~acmq/tesla/2sparks4.jpg > > Running: http://www.coe.ufrj.br/~acmq/tesla/2sparks2.jpg > > Sparks and light in the tube:
> > http://www.coe.ufrj.br/~acmq/tesla/2sparks3.jpg > > Detail: http://www.coe.ufrj.br/~acmq/tesla/2sparks1.jpg > > The average current is about 50 uA.
>
> That's a really neat setup.
>
> > I tried to reproduce the same experiment using an > > electrostatic machine. It worked. And the explanation is > trivial.
> > I placed a fluorescent tube over a metal plate (30x30 cm), > > over an insulating support, and placed the two pins at one > > end of the tube close to the two terminals of the machine.
> > When the machine operates, a continuous stream of sparks > > flows between the two terminals and the two pins. Both > > identical due to the symmetry.

> > If I connect one of the terminals to the metal plate in > > contact with the tube, the tube starts to glow and the sparks > > at that side are clearly more intense.
> > The reason is simple: The tube over the plate is acting as a > > capacitor, charged by the weak sparks. It discharges > > periodically with an intense spark between the other pin and > > the terminal connected to the plate, that is the outer plate > > of the capacitor.
> > (I observed that I can obtain a more intense effect if I made > > the connection between the metal plate and the machine > > terminal through a Leyden jar. The jar gets charged through > > the leakage across the surface of the glass tube, and the > > sparks are longer.)
>
> This is very interesting. The tube and plate are acting like a > capacitor. That makes sense. But wouldn't the capacitor act as > a transformer and reduce the potential in order to increase the > current? In other words, the thinner spark would be higher > potential, lower current. The thicker and brighter spark would > be lower potential, higher current. The total power in each > spark would be the same, correct?
>
> Dave

All that I have learned through experimentation and measurement says a loud "no" to your last question. Spark brightness is dependent on current and spark channel resistance drops in a non-linear fashion as current increases which means you cannot treat power in a spark channel as you would in a (for want of a better term) linear resistance. The strike distance is a function of voltage in the situation you are looking at. If the distances for the two sparks are the same and one spark is brighter than the other, which would you say is dissipating the most power?

Malcolm

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 18:16:53 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35616
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 18:17:03 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Malcolm,

>> The tube and plate are acting like a capacitor.
>> That makes sense. But wouldn't the capacitor act as >> a transformer and reduce the potential in order to >> increase the current? In other words, the thinner spark >> would be higher potential, lower current. The thicker and >>

brighter spark would be lower potential, higher current.
>> The total power in each spark would be the same, correct?
>
>
> All that I have learned through experimentation and > measurement says a loud "no" to your last question. Spark > brightness is dependent on current and spark channel > resistance drops in a non-linear fashion as current increases > which means you cannot treat power in a spark channel as you > would in a (for want of a better term) linear resistance. The > strike distance is a function of voltage in the situation you > are looking at. If the distances for the two sparks are the > same and one spark is brighter than the other, which would > you say is dissipating the most power?

You are asking me to prove a hypothesis with another hypothesis.

You mentioned that you have performed this type of experiment and made measurements in the past. Could I trouble you to show the data and experiment parameters?

It would be a shame to spend three years developing a new physics to quantify the phenomenon, and then not try to prove the theory right or wrong with real data. Don't you think? I need to remind you, I'm not asking you to prove or disprove my theory, I'm simply trying an experiment and asking for independent data.

But just to set things right, the logic for my statement above is simple. The capacitor is storing charge and then releasing it in larger, but less frequent breaks. That's what a capacitor does.
In my system of physics, increasing the capacitance also decreases the potential.

So what should I do? Should I trust your logic and just walk away from my work, trust my logic and blindly state I'm correct, or acquire solid data and solve the problem?

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
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Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 18:30:35 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35618
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 18:30:38 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

>But just to set things right, the logic for my statement above is
>simple. The capacitor is storing charge and then releasing it in

>larger, but less frequent breaks. That's what a capacitor does.
>In my system of physics, increasing the capacitance also
>decreases the potential.

I was wondering that too... Are the big sparks one-for-one with the small ones, or just a big spark say every say tenth time a small one hits... I'll have to dig through my toy box here to see if I have the stuff to find out...

>So what should I do? Should I trust your logic and just walk
>away from my work, trust my logic and blindly state I'm correct,
>or acquire solid data and solve the problem?

We can all draw our own conclusions... I think Malcolm has made up his mind and I did further back ;-)) But it is fun to fiddle with this stuff ;-))

Like politics and religion, I don't think anybody is going to change anybody's mind about the great theories behind all this, so we might as well just forget that... We all know "we" are right and "they" are wrong ;o)))

Cheers,

Terry

>Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 19:40:25 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35620
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 19:41:19 -0600 (MDT)

<x-flowed>
Original poster: "Antonio Carlos M. de Queiroz" <acmdq@uol.com.br>

Tesla list wrote:
>Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

>I was wondering that too... Are the big sparks one-for-one with the small
>ones, or just a big spark say every say tenth time a small one
>hits... I'll have to dig through my toy box here to see if I have the
>stuff to find out...

In my electrostatic setup the bright sparks are clearly less frequent.
They only occur when the "capacitor" is charged to the breakout voltage of the spark gap.

Antonio Carlos M. de Queiroz

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 19:40:53 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35619
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 19:41:04 -0600 (MDT)

<x-flowed>
Original poster: "Malcolm Watts" <m.j.watts@massey.ac.nz>

Hello Dave,

On 7 Jul 2005, at 18:16, Tesla list wrote:

> Original poster: "David Thomson" <dwt@volantis.org> >
> Hi Malcolm,
>
> >> The tube and plate are acting like a capacitor.
> >> That makes sense. But wouldn't the capacitor act as >> a transformer and reduce the potential in order to >> increase the current? In other words, the thinner spark >> would be higher potential, lower current. The thicker and >> brighter spark would be lower potential, higher current.
> >> The total power in each spark would be the same, correct?
> > >
> > > All that I have learned through experimentation and > > measurement says a loud "no" to your last question. Spark > > brightness is dependent on current and spark channel > > resistance drops in a non-linear fashion as current increases > > which means you cannot treat power in a spark channel as you > > would in a (for want of a better term) linear resistance. The > > strike distance is a function of voltage in the situation you > > are looking at. If the distances for the two sparks are the > > same and one spark is brighter than the other, which would > > you say is dissipating the most power?
>
> You are asking me to prove a hypothesis with another hypothesis.

I am asking a question to which there is, in the absence of any evidence to the contrary, an obvious answer. Rhetorical if you like.

> You mentioned that you have performed this type of experiment and made > measurements in the past. Could I trouble you to show the data and > experiment parameters?

Terry has just done it with lightbulbs. I see little point in repeating the exercise. I realize of course this is all completely unsatisfactory to yourself so.....

> It would be a shame to spend three years developing a new physics to > quantify the phenomenon, and then not try to prove the theory right or > wrong with real data. Don't you think? I need to remind you, I'm not > asking you to prove or disprove my theory, I'm simply trying an > experiment and asking for independent data.
>
> But just to set things right, the logic for my statement above is > simple. The capacitor is storing charge and then releasing it in > larger, but less frequent breaks. That's what a capacitor does. In > my system of physics, increasing the capacitance also decreases the > potential.

As long as the charge is held constant.....

> So what should I do? Should I trust your logic and just walk > away from my work, trust my logic and blindly state I'm correct, > or acquire solid data and solve the problem?

Go ahead and acquire your data and draw your own conclusions. I already have and have not found the need to introduce any further concepts to the existing framework of physics in this particular instance.

Malcolm

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Thu, 07 Jul 2005 20:06:57 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35621
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Thu, 7 Jul 2005 20:12:17 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

I set up some toys:

The digital scope now:
http://hot-streamer.com/temp/DaveTest-54.jpg

A Pearson 10:1 current probe on the ground lead of the ground wire.
http://hot-streamer.com/temp/DaveTest-55.jpg

And I arced it:
http://hot-streamer.com/temp/DaveTest-56.jpg

The scope traces look like this:
http://hot-streamer.com/temp/DaveTest40.gif http://hot-streamer.com/temp/DaveTest41.gif

Looks like the bright arcs are about 110 amps but it varies a lot. They fire once on every firing of the coil. In the first picture, you can see that the top voltage (yellow-no scale) (picked up by a plane wave antenna) is totally drained once the system arcs.

Now I just used the grounded rod:
http://hot-streamer.com/temp/DaveTest-57.jpg

http://hot-streamer.com/temp/DaveTest42.gif http://hot-streamer.com/temp/DaveTest43.gif

About 80 amp peaks now.

Just a plain arc is about 80 amps. With the rod the bright one is 110 amps. I note that just a single arc case is "middle" bright. Note how dim the toroid to ground arc is in this picture: http://hot-streamer.com/temp/DaveTest-56.jpg

So It appears that the arc with the rod has higher current than just a plain arc. The arc from the toroid to the rod seems dimmest of all. The rod seems to be picking up some added current that seems to be significantly greater greater than the toroid to rod current.

Nothing unexpected... The bright rod to ground arc is does not seem to be a storage of many previous arcs effect. The two arcs seem to occur at the same time, all the time.

Cheers,

Terry

At 06:30 PM 7/7/2005, Terry Fritz wrote:
>Hi Dave,
>
>
>>But just to set things right, the logic for my statement above is
>>simple. The capacitor is storing charge and then releasing it in
>>larger, but less frequent breaks. That's what a capacitor does.
>>In my system of physics, increasing the capacitance also
>>decreases the potential.
>
>I was wondering that too... Are the big sparks one-for-one with the small
>ones, or just a big spark say every say tenth time a small one
>hits... I'll have to dig through my toy box here to see if I have the
>stuff to find out...
.....

</x-flowed>
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X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Fri, 08 Jul 2005 11:06:08 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>

Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35640
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Fri, 8 Jul 2005 11:06:24 -0600 (MDT)

<x-flowed>
Original poster: "Antonio Carlos M. de Queiroz" <acmdq@uol.com.br>

Tesla list wrote:

>Original poster: "David Thomson" <dwt@volantis.org>

>This is very interesting. The tube and plate are acting like a
>capacitor. That makes sense. But wouldn't the capacitor act as
>a transformer and reduce the potential in order to increase the
>current? In other words, the thinner spark would be higher
>potential, lower current. The thicker and brighter spark would
>be lower potential, higher current. The total power in each
>spark would be the same, correct?

The potentials where the two sparks start are about the same, as the two gaps are identical, and the shapes of the terminals too. There is an asymmetry due to the different polarities of the terminals, that causes some small difference.
The peak current in the brighter discharge is greater, because it is generated by the discharge of a relatively large capacitance, while the current in the weak spark is limited by the electrostatic machine. The average powers in the sparks are not identical:
Let the gap voltage v and the charging current i be fixed, because the electrostatic machine acts as a current source.
The capacitance C is charged to v by i in a time T=Cv/i.
It then discharges the energy E=0.5Cv^2.
The average power in the strong spark is then 0.5Cv^2/T = 0.5vi.
In the weak spark a current i flows all the time (in average).
The power there is then vi.
So the average power in the weak spark is two times larger (?!).
But the peak power is much higher in the strong spark.
In the case of a Tesla coil, there are some differences, the most important being the current through the capacitance between the coil and the tube, that is in parallel with the weak spark, and adds its current to the strong spark, as Terry demonstrated.
But the strong sparks are probably mainly caused by the high peak currents of the discharge of the capacitance of the tube to the ground.

Antonio Carlos M. de Queiroz

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Fri, 08 Jul 2005 16:28:14 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge

Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35642
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Fri, 8 Jul 2005 16:30:47 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Antonio,

You give a nice analysis, but unfortunately the analysis begins by guessing the very parameter I'm trying to objectively measure.
That doesn't help at all.

Is there a way to measure electrostatic potential in between sparks? We should see a potential rise just before the spark breaks. Maybe an oscilloscope can inductively pick up the signals?

What if three independent current loops are placed around each of the topload, tube, and ground rods, like the connection for an automobile timing light to a spark plug wire? To standardize the measurements, all three probe ends could pass though a 2" piece of high voltage wire with the exact number of pickup loops wrapped around the middle of each one. Then measure the potential difference between each pair of pickups. That should give us the relative potentials. If we want the exact potentials, the measurements can be calibrated to the known topload and ground potentials.

What do you think?

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Fri, 08 Jul 2005 16:28:50 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35643
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Fri, 8 Jul 2005 16:31:11 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Terry,

I just got to this post.

 > Just a plain arc is about 80 amps. With the rod the bright > one is 110 amps.

This is good information. Thanks. If the potential remains about 20KV, then each

spark is releasing 2950 hp. Tesla commented on this several times. It's pretty amazing that the copper pipe picks up 805 hp per break.

 > They fire once on every firing of the coil.

That's pretty clear, now.

 > I note that just a single arc case is "middle" bright.
 > Note how dim the toroid to ground arc is in this picture: > http://hot-streamer.com/temp/DaveTest-56.jpg

It is also interesting that a 38% increase in current makes the ground spark seem much brighter. I wonder if the luminosity of the spark increases only by 38%, or if it is much higher?

 > So It appears that the arc with the rod has higher current > than just a plain arc. The arc from the toroid to the rod > seems dimmest of all. The rod seems to be picking up some > added current that seems to be significantly greater greater > than the toroid to rod current.

Well, it can't be "significantly" greater. It is only 38% greater. We still don't have a measurement for the potentials to know whether they are equal or not.

It would seem to me that since the spark appears much brighter than a 38% increase that some of the potential coming from the topload to tube might be converted to current between the tube and ground.

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Fri, 08 Jul 2005 17:04:09 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35648
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Fri, 8 Jul 2005 17:04:50 -0600 (MDT)

<x-flowed>
Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>

Hi Dave,

At 01:41 PM 7/8/2005, you wrote:
>Hi Terry,
>
>I just got to this post.
>
> > Just a plain arc is about 80 amps. With the rod the bright
> > one is 110 amps.
>
>This is good information. Thanks. If the potential remains

>about 20KV, then each spark is releasing 2950 hp. Tesla
>commented on this several times. It's pretty amazing that the
>copper pipe picks up 805 hp per break.

Not that those are peak instantaneous power levels. May coil is not 2.2MW rated ;-)) Joules is the usual energy measure, but maybe peak instant power is a bit nicer in this case.

> > They fire once on every firing of the coil.
>
>That's pretty clear, now.

Maybe not... The coil has many high voltage peaks during each cycle. It is possible the rod is charged at the"cycle to cycle" level instead of the "break to break" level The rod to ground hit is definitely a "one time" big hit. But there might be many streamer hits leading up to that between the toroid and rod... But the toroid is AC too so it should null out to zero... But the sharp point to big surface makes a sort of rectifier too... It could get very messy ;-))

> > I note that just a single arc case is "middle" bright.
> > Note how dim the toroid to ground arc is in this picture:
> > http://hot-streamer.com/temp/DaveTest-56.jpg
>
>It is also interesting that a 38% increase in current makes the
>ground spark seem much brighter. I wonder if the luminosity of
>the spark increases only by 38%, or if it is much higher?

It might be a current squared function. In that case the spark would be 90% brighter. But I am not sure the current to brightness curve is linear especially if we are going from the purple to white transition region.

> > So It appears that the arc with the rod has higher current
> > than just a plain arc. The arc from the toroid to the rod
> > seems dimmest of all. The rod seems to be picking up some
> > added current that seems to be significantly greater greater
> > than the toroid to rod current.
>
>Well, it can't be "significantly" greater. It is only 38%
>greater. We still don't have a measurement for the potentials to
>know whether they are equal or not.

The rod to ground gap and arc voltage should be almost DC, that is fairly easy . Goodness only knows what the leader Tesla arc from the toroid to the rod is. But if there are sparks going on nearby with High Frequency noise, those voltages could be bumped to far lower values...

>It would seem to me that since the spark appears much brighter
>than a 38% increase that some of the potential coming from the
>topload to tube might be converted to current between the tube
>and ground.

The spark from the rod to the ground is also "super" fast!! But the arc from the toroid to rod may be stretched out over a greater amount of time. So the "arc time duration" may be indeed a significant factor...

Messy it is getting now :o)))

I'll see if I can figure anything out here...

Cheers,

Terry

>Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Fri, 08 Jul 2005 18:47:57 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35652
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Fri, 8 Jul 2005 19:12:56 -0600 (MDT)

<x-flowed>
Original poster: Jim Lux <jimlux@earthlink.net>

At 04:04 PM 7/8/2005, Tesla list wrote:
>Original poster: Terry Fritz <teslalist@twfpowerelectronics.com>
>
>
>>It is also interesting that a 38% increase in current makes the
>>ground spark seem much brighter. I wonder if the luminosity of
>>the spark increases only by 38%, or if it is much higher?
>
>It might be a current squared function. In that case the spark would be
>90% brighter. But I am not sure the current to brightness curve is linear
>especially if we are going from the purple to white transition region.

To a first order, the total light energy will be proportional to the energy dissipated in the spark. (that is, sparks are a pretty efficient "light bulb", which is why xenon short arc lamps are popular) Here's the gotchas:

1) The spectral sensitivity curve. Your eye, for instance, is less sensitive to blue than to green light. Oddly, (or not so oddly), your eye's spectral response matches a black body at around 5500K (the apparent black body temperature of the sun).

2) Time integration. Your eyes, CCD sensors, and photographic film all have different sensitivities depending on the length of exposure (called reciprocity failure in film).

3) Apparent brightness is related to apparent size of the source, which will be affected by the current in the spark.

In general, spark channel diameter grows as the square root of current (that is, the current density tends to remain constant). But, there's also an energy balance issue.. Bazelyan and Raizer go into all this in some detail for the dynamic case. Earlier works such as those by Cobine (Gaseous Conductors) and Somerville (The Electric Arc) have more on steady state arcs.

>> > So It appears that the arc with the rod has higher current
>> > than just a plain arc. The arc from the toroid to the rod
>> > seems dimmest of all. The rod seems to be picking up some

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Mon, 11 Jul 2005 11:59:40 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35730
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Mon, 11 Jul 2005 12:01:22 -0600 (MDT)

<x-flowed>
Original poster: "Antonio Carlos M. de Queiroz" <acmdq@uol.com.br>

Tesla list wrote:

>Original poster: "David Thomson" <dwt@volantis.org>
>Hi Antonio,
>You give a nice analysis, but unfortunately the analysis begins
>by guessing the very parameter I'm trying to objectively measure.
>That doesn't help at all.

It's well known since the XVIII century that breakdown voltage is almost completely a function of the shape of the terminals. Pressure and temperature have important effect too, but in this case these conditions are practically the same in both gaps. More subtle effects are the potentials of the terminals to ground and surrounding objects (affects the electric field distribution), the polarity (the negative side breaks down first in a symmetrical gap), and level of ionizing radiation on the terminals (ultraviolet light and higher frequencies).

>Is there a way to measure electrostatic potential in between
>sparks? We should see a potential rise just before the spark
>breaks. Maybe an oscilloscope can inductively pick up the

>signals?

A capacitive divider is relatively easy to implement and calibrate.

>What if three independent current loops are placed around each of
>the topload, tube, and ground rods, like the connection for an
>automobile timing light to a spark plug wire? To standardize the
>measurements, all three probe ends could pass though a 2" piece
>of high voltage wire with the exact number of pickup loops
>wrapped around the middle of each one. Then measure the
>potential difference between each pair of pickups. That should
>give us the relative potentials. If we want the exact
>potentials, the measurements can be calibrated to the known
>topload and ground potentials.

Anything inductive would measure currents, not voltages.

Antonio Carlos M. de Queiroz

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Mon, 11 Jul 2005 13:09:40 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: RE: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
X-Mailing-List: <tesla@pupman.com> archive/latest/35737
X-Loop: tesla@pupman.com
Resent-Sender: tesla-request@pupman.com
Resent-Date: Mon, 11 Jul 2005 13:10:10 -0600 (MDT)

<x-flowed>
Original poster: "David Thomson" <dwt@volantis.org>

Hi Antonio,

> >Original poster: "David Thomson" <dwt@volantis.org> Hi Antonio, You
> >give a nice analysis, but unfortunately the analysis begins by guessing
> >the very parameter I'm trying to objectively measure.
> >That doesn't help at all.
>
> It's well known since the XVIII century that breakdown > voltage is almost completely a function of the shape of the > terminals.

This almost sounds like knowledge. But is it? If they had the means for measuring the potential across terminals 300 years ago, why can't we do it just as easily today? I'm kind of curious as to which brand of voltmeter they used then. My understanding is that It was 1796 when Allessandro Volta finally was able to measure the weakest of potentials with his electrometer. The potentials were caused by bringing two dissimilar metals into contact. I somehow doubt that in four years that the knowledge to quantify the potentials between two gaps, as we are doing now, was developed.

As for the shape of the terminals affecting the potential, this is also what I predicted.

>From what I have seen so far, there is no quantifiable evidence suggesting that there is only one manifestation of charge. The fact that I can quantify two distinct manifestations of charge, and the fact that the data both supports and does not exclude the possibility, is reason for me to continue with my pursuit.

> >Is there a way to measure electrostatic potential in between sparks?
> >We should see a potential rise just before the spark breaks.
Maybe an
> >oscilloscope can inductively pick up the signals?
>
> A capacitive divider is relatively easy to implement and calibrate.

Are you saying that we can connect a capacitor directly across the gap, and then tee another capacitor to test equipment in order to determine the relative potentials in the gaps? So long as we use the same values for both sides?

Dave

</x-flowed>
Old-Return-Path: <teslalist@twfpowerelectronics.com>
X-Original-To: tesla@pupman.com
Delivered-To: tesla@pupman.com
X-Sender: teslalist@twfpowerelectronics.com
X-Mailer: QUALCOMM Windows Eudora Version 6.0.3.0
Date: Mon, 11 Jul 2005 18:02:12 -0600
To: tesla@pupman.com
From: "Tesla list" <tesla@pupman.com>
Subject: Re: Terry's Test - Two Manifestations of Charge
Resent-From: tesla@pupman.com
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Original poster: "Antonio Carlos M. de Queiroz" <acmdq@uol.com.br>

Tesla list wrote:
>Original poster: "David Thomson" <dwt@volantis.org>

> > It's well known since the XVIII century that breakdown
> > voltage is almost completely a function of the shape of the
> > terminals.
>This almost sounds like knowledge. But is it? If they had the
>means for measuring the potential across terminals 300 years ago,
>why can't we do it just as easily today? I'm kind of curious as
>to which brand of voltmeter they used then.

Pitch ball electromers and electroscopes. It's easy to make comparative measurements with these simple devices. Someone could easily verify that a gap with small balls produces a spark with less voltage than a gap with large balls. An could also verify the effect of several possible influences. I don't know if someone actually did it, but it would be trivial.

>My understanding is

>that It was 1796 when Allessandro Volta finally was able to
>measure the weakest of potentials with his electrometer. The
>potentials were caused by bringing two dissimilar metals into
>contact. I somehow doubt that in four years that the knowledge
>to quantify the potentials between two gaps, as we are doing now,
>was developed.

There is no need of a condenser electroscope to measure, or at least compare, spark voltages. Even a crude electroscope can detect a few hundreds of volts.

>As for the shape of the terminals affecting the potential, this
>is also what I predicted.
> >From what I have seen so far, there is no quantifiable evidence
>suggesting that there is only one manifestation of charge. The
>fact that I can quantify two distinct manifestations of charge,
>and the fact that the data both supports and does not exclude the
>possibility, is reason for me to continue with my pursuit.

Nothing new expected, after so many experiments.

> > A capacitive divider is relatively easy to implement and
>calibrate.
>Are you saying that we can connect a capacitor directly across
>the gap, and then tee another capacitor to test equipment in
>order to determine the relative potentials in the gaps? So long
>as we use the same values for both sides?

Yes. A high-voltage capacitor with small capacitance in series with a large, low-voltage, capacitor. The instrument goes in parallel with the large capacitor. A spark across the series association produces a step in the electroscope, with amplitude proportional to the potential across the gap just before the spark. Two high- voltage capacitors, one at each side of the large capacitor, can be used for measurements in a floating gap. One side of the large capacitor shall be grounded, for a safe connection to an oscilloscope.

Antonio Carlos M. de Queiroz

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