Rewriting the Rayleigh equation

by Miles Mathis

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About a year ago, I promised to rebuild the Rayleigh equation from the ground up. Although I forgot to work on it until today, I found I was able to do the job in a matter of hours. I have learned some things in the meantime that helped me see how to solve it, so I guess it was best I left it until now. If you like math, you may like this paper. If you don't, I'm afraid this one won't thrill you.

If you will remember, I showed near the end of that last paper on the subject that what we needed to do is include the charge field of the Earth in the equation. Without the charge field, there is no way to logically explain the increase in brightness as we go lower in the atmosphere. Rayleigh scattering is currently a form of anti-Stokes luminescence, with photon energy being mysteriously up-converted with no cooling of the atmosphere.

We will start from the current equation and whittle it down to something more sensible.

$$I = I_0 \frac{1 + \cos^2 \theta}{2R^2} \left(\frac{2\pi}{\lambda}\right)^4 \left(\frac{n^2 - 1}{n^2 + 2}\right)^2 \left(\frac{d}{2}\right)^6$$

That is one form of the current equation. For molecules, we are given a variant form:

$$I = I_0 \frac{8\pi^4 \alpha^2}{\lambda^4 R^2} (1 + \cos^2 \theta).$$

If we study those equations while looking closely at the problem they claim to solve, we see that we don't need R in the equation at all, since if we are calculating I from I_0, we could and should just assume we are measuring the intensity of both from the same distance. When we sum all these

interactions, we won't need that distance, since it will be absorbed by the summation. We can also ignore angles, since we will start by assuming all light is coming straight down. We will build an equation for one position only, and then we can sum up from that position later. We also no longer need angles of impact (of a photon with a molecule, for instance), since we are letting photons collide. We can let them do that in a line, with Solar photons coming straight down and charge coming straight up. We can then sum all the lines, like an integral, rather than fooling with angles.

But the main reason we don't need angles is that the equations above were pushed from the beginning. They are not only pushed, they are floaters. Diversions. Since Rayleigh scattering as applied to the atmosphere has always been an interaction that yielded more energy out than in, there was never any possible way to express that with angles. Given mainstream theory, you would need to include some sort of over-unity angles, which of course don't exist. In other words, the angles in the equation above are there only to divert you. If they get you thinking about angles you forget to ask them how the process is over-unity. The current equations are only posted to make you think that they have something here, but they don't. They have some data, and they have pushed these equations toward data, as usual. But they haven't the faintest idea what is going on as a matter of mechanics.

Notice that if you remove all the meaningless and unnecessary variables and terms, you are left with almost nothing. If you remove R and the angle representation and *pi* and simplify *n* down to what is really necessary to solve, you are left with an equation with almost no content. You would be left with something like this:

$$I = I_0 (n - 1)r^6/\lambda^4$$

Not only can the problem not possibly be solved with that, but it *looks* way too simple at a glance. Your average reader wouldn't be fooled by it. That is why they were forced to pad it out: they needed to make it look more impressive. That is what I mean when I say the equation is just a floater. It was created to make it appear to address the problem in some way, but it really doesn't. It is not a real field equation, it is just a simulacrum of a field equation, posted to fool the credulous.

The logical thing to do is write the initial equation for brightness at noon—maximum brightness—and then later sum the whole sky. If you write the equation for atmosphere right between Earth and Sun, you don't need angles. This is a field equation, to start with, and you want to get your fields right. The mainstream never found its second field, so all talk of angles was premature.

Yes, the major correction concerns incorporating the charge field coming up. To get this, we have to write the equation as a sum:

$$I = I_0 + C$$

Where C is the energy of the rising charge field at the point of interaction. Once we do that, we see that the molecule involved is almost immaterial. Or, it is a tertiary consideration, since the main fields are the photon field coming down and the photon field going up. The molecules in the atmosphere recycle some of the charge coming up, and this recycled charge then up-converts any photon that interacts with the molecule's field.

You will say, "Why not just let the two photon fields interact directly? Why involve the molecules at all?" Because the photon fields by themselves don't have enough density to interact *that much*. They do interact to a small degree, but the phenomenon we are analyzing here isn't due to that small

interaction. It is due to the photons coming down interacting with charge coming out of the molecules. You see, the molecules recycle the charge field, and as they do that, the charge field is given a much higher density. To pass through the nuclei, the charge field has to be compressed. Well, as that charge field exits the molecule through the north pole, it encounters the photon field coming down. In that case, the charge field has enough density to cause a large number of photon-photon spin collisions, and that is what causes this effect.

I am going to rewrite the basic Rayleigh equation, but I am not going to sum up the field in this paper. I will just show the method and let someone else do the dirty work. I see my job as correcting the fields and variables, not doing all the integrals. This is a theoretical paper, like all my papers. I don't have the time or the inclination to do pages of integrals. You begin to see how complex the problem really is, since to sum we will have to include altitude. You have to know the altitude because 1) the charge field dissipates at higher altitudes, 2) the molecular density dissipates at higher altitudes, 3) the initial intensity is greater at higher altitudes because less brightness has been blocked by redirected sunlight (real scattering).

I say real scattering, because Rayleigh scattering isn't even scattering. As we have seen, it is a complex up-conversion of photons by charge field interaction. Scattering would create less brightness at lower altitudes, while up-conversion creates *more* brightness at lower altitudes.

You will say, "Couldn't we have both here?" We do have a small amount of scattering, but from the data we can see it must be nearly negligible, scattering far less than 10^{-6} of the light. So we can either ignore it, or write it into the equation as a fraction of the main effect. In other words, if we let the second term be the dimming term and the third term be the brightening term, we would have something like this:

$$I = I_0 - [x\, I_0\, (n - 1)] + [(1 - x)\, I_0\, (n - 1)\, C]$$

Where x is the fraction of light coming down that is truly scattered. If the third term is greater than the second term, we will have brightening in the atmosphere. This tells us that most light will take part in the main charge interaction we will be looking at below. That is to say, most light that hits an atmospheric molecule will hit the molecule's upper charge field in a way that causes photon up-conversion rather than simple scattering. That is what the data tells us and what this rough equation represents.

It is clear I intend C to represent the charge field interaction, but what is n? In the current Rayleigh equation, it is the refractive index n that tells us how much we are losing to straight scattering. It is mainly a measure of transparency. Air has a low refractive index because it reflects or diverts only a small part of the incoming light. Since $(n - 1)$ has a value of .0003 in this problem, the odds are low that any given collision will occur. At any given altitude, most of the photons are going to pass with neither scattering nor up-conversion. That is why I include that term in both the dimming term and the brightening term. It indicates the likelihood of an initial hit.

If you study the current Rayleigh equations above, you see that none of the terms have any way to indicate the density of the Earth's rising charge field. So there is no way the current Rayleigh equation can represent the actual process. Only by writing the Rayleigh equation as a sum can we correctly represent the fields and interactions involved. Notice that the current equations are written as products. The terms are multiplied together, aren't they? But in my equation, we have three major terms, and we have a minus sign and then a plus sign. That is what I mean by a sum.

In current math, they try to bring in the charge field by creating a term called *molecular polarizability.* At Wikipedia, it is defined like this:

Electric polarizability is the relative tendency of a charge distribution, like the electron cloud of an atom or molecule, to be distorted from its normal shape by an external electric field, which is applied typically by inserting the molecule in a charged parallel-plate capacitor, but may also be caused by the presence of a nearby ion or dipole.

So they seem to realize they need something along those lines, but they really have no way of creating it in the atmosphere with current theory. The atmosphere isn't in a capacitor or in the presence of a nearby ion. Since the polarizability α is the ratio of the dipole moment p to the electrical field E, they need to show the source of E in this problem. They can't do that directly because 1) they don't have my rising charge field, 2) the charge field present isn't strictly an E field. It is only a sub-E field. A Maxwellian displacement field. Since it is created and composed and mediated by photons directly, without intervening ions, it is charge, not electricity. The entire atmosphere is charged, even where no ions are present.

In the next step, I need to show how C interacts with the first term. We don't just add C straight to the intensity, do we? No. To represent how C and I_0 will interact, we have to compare energies. We can do that with wavelengths, to match the current expression, but we could also do it with frequencies or energies or photon radii. Since I have shown that the charge field C peaks in the infrared, with a wavelength of about 250nm, we need a term relating that wavelength to the wavelength coming down.

$$[(1-x)\, I_0\, (n-1)\, (\lambda_0/\lambda_C)]$$

That is our third term now, and it indicates how the charge field is shifting the incoming energy up. I stress that this is a sub-magnetic effect, or an outcome of real spin. The photons are being spun up, just as they are spun up on the nuclear pole of Iron. The wavelength ratio here indicates the photon radius ratio, which also indicates the photon spin ratio. It tells us how much the charge field is able to spin-up the down-coming light field.

You will say that photon fields meeting head-to-head should tamp one another down, not augment. But that is not true in this particular case. In some cases it is true, but not here. As charge photons are recycled through the Earth, the spins seem to reverse, simply because they are viewed from the other side. What we originally watched go in is now coming out. What was originally going down is now going up, relative to us. So from the point of view of the light photons coming directly *down*, the recycled charge photons have appeared to flip. They are now anti-photons, in a sense. And when you collide photons and antiphotons together head-to-head, you get spin augmentations rather than spin cancellations. This is precisely why we find brightening here. Without flipped photons and rising charge, we could not explain atmospheric brightening or photon up-conversion without a cooled atmosphere.

We are getting closer to a corrected equation, but we still need to include the specific charge profile of the molecule involved. It isn't just a matter of the molecular density, it is a matter of how the molecule recycles charge through its nuclei. This will differ from element to element. This is why the mainstream includes the polarizability of the molecule. Basically, we need to known how much charge the molecule is recycling as through-charge. Atmospheric molecules on the zenith at noon will align to the charge field, with their poles pointing up to the sky. But depending on how magnetic or conductive

these molecules are, most of the charge will be recycled out the molecular equator, instead of being recylced from pole to pole. If it is emitted like that, the charge can't take part in the interaction we are studying, because it is then moving to the side, not up. Only charge that goes from pole to pole can be emitted at the north end of the molecule, meet the down-coming photons, and be spun up. Therefore we need to express polarizability not as p/E, but as a fraction of 1 (1 being all ambient charge). We therefore need a new dimensionless variable with values between 0 and 1, giving our third term this form:

$$k[(1-x)\, I_0\, (n-1)\,](\lambda_0/\lambda_C)$$

We could back-calculate k from either magnetism or conductivity; but, perhaps surprisingly, it is easiest to back-calculate from thermal conductivity. It is easiest because we can transfer dimensions far more quickly. Thermal conductivity is already expressed in dimensions that almost match what we need here, as you will now see. It also allows us to pull in some other numbers that may surprise you.

Since I have shown that charge is equivalent to heat at the quantum level, what we have always called thermal conductivity is simply a measure of charge conduction. That is precisely what we need here. Even more surprisingly, we can estimate an answer by simply inserting the current number value for thermal conductivity as k, and dropping the dimensions. For instance, if we go to the tables, we find the thermal conductivity of nitrogen is about .026. Insert that value for k and then solve the equation above (letting $x=0$ for now]. If you use the given value of 1.0003 for n, and let the light coming down average at yellow (580nm), you obtain I_0 (1.81 x 10^{-5}) for the term. That should look familiar, since that is what they get for the current Rayleigh equation. Remember, from Wikipedia:

This means that at atmospheric pressure, about a fraction 10^{-5} of light will be scattered for every meter of travel.

We can even match that "every meter of travel," since of course one of the dimensions we let slide when we dropped the dimensions of thermal conduction was 1/m. Thermal conduction is measured in Watts *per meter*. So as we continue to fine-tune this solution, we will try to keep that 1/m dimension.

Your head may be spinning, but after your astonishment dies down, you may ask, "How can that work? I sort of understand why you use thermal conduction, but how can you just drop dimensions? That doesn't make any sense, and just looks like a trick." It only gives us an estimate—as we will now see —but it isn't a trick. It is justified by the fact that thermal conduction is actually measured in Watts per meter *per degree Kelvin*. In this case, a Watt over a degree Kelvin resolves to near 1, leaving us with only 1/m. So we can basically drop the dimensions, keeping the current value in the tables.

You will say, "How is that?" Well, a Watt is one J/s. To bring in K, let's look at Boltzmann's constant:

$$k_B = 1.38 \times 10^{-23} \text{J/K}$$

Since that means there are 1.38×10^{-23} Joules in each change of 1 degree Kelvin, we could write that as

$$1K = 1.38 \times 10^{-23} \text{J}$$

That is how Joules relate to degrees Kelvin, when you are dealing with blackbody radiation or charge (which are the same thing). But we have no indication of time there. How does a degree Kelvin relate to a Watt? Well, to get that last equation to resolve to 1, we would have to find our reaction also taking 1.38×10^{-23}s. In that case

K = 1.38×10^{-23}J/1.38×10^{-23}s = 1W

That just means in order to get change in a degree Kelvin to equal a Watt of power, we would have to compress that change into a tiny split second. As it so happens, that is about the time of our reaction, since that is roughly the time it takes the photon to move through the molecule.

d = c(1.38×10^{-23}s) = 4.14 x 10^{-15}m

If that were the diameter of the nitrogen molecule, we would be golden. However, all that was just an estimate, as I admitted. We can now fine-tune that, since I have shown in previous papers the molecule isn't quite that small. And in fine-tuning it, we will be able to complete our new equation. The nitrogen molecule is about 530 times larger than our diameter above.* Of course, working backward, that throws off our time, which throws off our 1-to-1 ratio of K to W, which seems to throw off our dropping-of-dimensions trick.

But it turns out that the 1/m dimension in thermal conduction isn't really equivalent to 1/m in the atmosphere, so we have a little work left to do. In other words, the "per meter" in thermal conduction isn't the same as the per meter in the Rayleigh equation. The problem has to do with density once again, because with thermal conduction, the given number of .026 is for nitrogen at 300K. The density of nitrogen in that case is about 1.2, whereas the density of nitrogen in the lower atmosphere is about .0012, a difference of 1,000 times. This brings us back to within a factor of 1,000/530 = 1.88. What that means is that we aren't 530 times off in our dimensional analysis, we are now only 1.88 times off.

So, if we apply all those fine-tunes to our equation, we end up with

$(\lambda_0/\lambda_C)(n - 1)k$ = (1.81 x 10^{-5})/1.88 = 9.6 x 10^{-6}

That is within 4% of the current Rayleigh equation, which found a value of 10^{-5}. And that means that my use of Boltzmann's constant and the speed of light to fit the thermal conductivity variable into the equation worked perfectly. And since I led you through all the steps, hopefully you understand *why* they are in there. I took you in on the path I myself took, and although that path may have seemed to meander a bit, you can now see the method in my apparent madness.

Now, we just replace k in the equation with k_T(d/k_Bc)

$I = I_0 - [x\,I_0\,(n - 1)] + [k_T(d/k_B c)(1 - x)\,I_0\,(n - 1)\,(\lambda_0/\lambda_C)]$

k_T = thermal conductivity at the given density, not the standard density
d = diameter of the molecule, using the fine-structure constant correction (see footnote below). This is not the current diameter listed in tables. We are concerned only with the nuclei, not with the molecules as a whole.
k_B = Boltzmann's constant

That is the final equation. Yes, it is a bit longer, but it is far more transparent. Despite being much more direct and logical, it contains an entire field that the old guys missed. I have incorporated the charge field of the Earth into the equation, even while clarifying it. Not only that, but I have shown you how every term works, and why it is there. In other words, my equation is completely mechanical and completely transparent. The current equation is non-mechanical, opaque, and in some ways false.

Since it does not express the correct physics, it is a false physics equation.

My equation also shows you how and why there is a brightness increase. The current equation actually shows a decrease, which they have to fudge into an increase by adding I_0 back in while you aren't looking. I don't need to do that. I can put it all right in front of you because with my field mechanics, it doesn't beg any questions that can't be answered.

After the fact, you should be able to see why it is logical to use the new variables I did in this problem, treating the interaction in the atmosphere as a blackbody radiation interaction. That is the easiest and most direct way to include the charge field in the equation. As I said, we could have solved by using either the magnetic field or the electrical field of the particle, but that would have required we manipulate the current numbers to a much greater extent. As you see, we had to do very little to the current expression for thermal conductivity to use it in this equation.

So far, we have ignored the value of x, since I have told you it is going to be much less than 1. In order to match data, we know that x must be smaller than .03. So we know that less than 3% of photons are being scattered. The rest are being spun up by the charge field. But is there a way to calculate or estimate a number for x, without back-calculating it from data?

There is, but we have to look more closely at the local mechanics. Since these air molecules are most often not ionized, the nitrogen will have its electrons on the poles. So we have to look at how the electron on the north pole of the molecule will affect this interaction. Since I have proven elsewhere that electrons recycle only 1/1821 the charge field of the proton, the electron in that position will actually be diverting that amount of charge out to the side. This diverted charge will no longer be "conducted," since it is no longer moving along the molecular axis from south to north. Only charge moving on the axis is considered to be conducted charge. Since it is no longer in the line of interaction, it can't be spun-up by the photon collisions. And if photons coming down hit this jet of charge going out to the side, they will be scattered, not spun-up. From this alone, we can see that the percentage of photons scattered is not 3%, but more on the order of .055%. So the value of x is

$x = 1/1821 = .00055$

This makes the value of our second term in the equation 1.65×10^{-7}. This means that the dimming is only 1.7% of the brightening in each interaction. Or, 98.3% of the interaction causes brightening.

Now to answer questions. Some will say, "Haven't you been telling us the atomic world is larger than we thought? Now you are telling us it is smaller." Yes, I have shown the proton is about 50 times larger than we are told, due to mistakes in the quantum equations, going all the way back to Rutherford and his scattering equations. But here, I am using a number for the nitrogen molecule that is 137 times *smaller* than the current number. That is because the number I need is the diameter across the two nuclei, disregarding what they now call the electron orbitals. When they give you a molecular diameter in the current tables, they are including what they think are orbitals. What they are really including are the distances at which electrons can be captured, not the distances at which electrons reside, but they don't know that, and that is the topic of other papers. I am not including those distances here, since they aren't the distances the photons are traveling in the interaction. The photons in this problem are recycling through the nucleons, so neither orbitals nor electron capture distances matter. In other words, we are only interested in the nuclear radii of the two nitrogen atoms, plus the distance between them.

Another question I am sure will come up concerns this manipulation:

$$k_B = 1.38 \times 10^{-23} \text{J/K}$$
$$K = 1.38 \times 10^{-23} \text{J}$$

I can already see a lot of mainstream types going, "What in God's name did you just do! You can't just move K over to the other side like that!" It reminds me of the physics forum guy who told me $e = 1.602 \times 10^{-19}$ C wasn't an equation. These guys don't even understand the information their equations contain. *Of course* these are equations, and of course you can treat them as equations, substituting into them and dividing both sides by equal amounts and so on. I will be told that the second equation is correct there only if $k_B = 1$. Yes, that is right. I am letting $k_B = 1$, to see what that tells me about the relationship of J to K. I am purposely manipulating Boltzmann's constant in order to discover the relationship of J to K in our problem. Why? Obviously because I want to legally drop those dimensions from the thermal conductivity term. Instead of just dropping them for convenience or as a trick, I wish to drop them legally. *While* I am dropping them, I am looking for a way to use these numbers in my larger equation. As you saw, I did that by working in the particle diameter and the speed of light. I could only do that by understanding how J and K related to one another both in the thermal conductivity term and Boltzmann's constant—as well as in the charge field, blackbody radiation, and in nuclear channeling.

But the best way to justify my manipulation is to point to the end product. If it had been illegal, do you think I would have been able work all those terms together like that, having not only the numbers but the dimensions work out in the end?   Do you think it was just luck that the dimensions resolved at the same time that I was able to match the mainstream's data?

I already admitted I wouldn't bother summing up my equation into an expression that applied to the entire atmosphere, but I will give anyone who works on it some pointers. The first one is that any vertical summation has to take into account the fact that lower points will be benefiting from the increased brightness caused by upper points.   The variable I_0 is not a fixed number, but will itself rise as we move down toward the Earth.

That may have been obvious, but what might not be obvious is that although we get greater brightness at lower altitudes due to photon up-conversion, the *density* of down-coming light actually drops. Remember, we have real scattering at all altitudes, and so at each level some percentage of the original light will be lost to reflection. The dimming part of the equation indicates lower photon density as we move down, while the brightening part of the equation indicates more energetic photons. So we have fewer photons, but bigger photons. The shifted photons are what caused the blue color and the rise in overall energy, while the scattered photons cause the whiteness.

How might this affect the equation, or the summation? It will affect the value of x. At lower altitudes, you will have more charge recycled and a greater density of molecules, increasing the odds of interaction. But since fewer photons are coming down, the odds decrease. But the first effect will trump the second, giving an increase. Any precise summation would have to include that variation, although it is small.

I will conclude by pointing out how my new equation changes most of the claims of current theory. We are now told that the sky is blue because "Rayleigh scattering is inversely proportional to the fourth power of wavelength, so that shorter wavelength violet and blue light will scatter more than the longer wavelengths." But that was always just a push to explain data, as we now see. The sky is not blue

because molecules scatter more blue light. The sky is blue because the Earth's charge field up-converts an initial spectrum of less energetic light up into the blue range. In this way, Rayleigh scattering is not scattering at all (for the most part), [but an analogue of magnetic reconnection](#).

The same thing applies to all the other "theory" surrounding Rayleigh scattering. Since the effect isn't scattering to start with, all the claims made about the effect are false. In rewriting the equation, we have to rewrite all the theory as well. Nothing will stand.

*The short-cut to that number is to divide the current diameter of the N2 molecule—which is said to be 300pm—by the fine structure constant 137. You end up with 2.2×10^{-12}m, which is 530 times 4.14×10^{-15}m.