Earth Thermal Resonance Model with gravitational side effects

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Abstract

I build a theoretical model of the relationship between the solarconstant and earth surface temperature by using temperature to obtain energy density instead of surface flux.

Earth behave as a standing wave in resonance, shown in the resulting energy levels.

Energy density of vacuum from the cosmological constant is added. The result is a function of pi that shows how earth is not only dependant of solar radiation for energy content, it is a three point exchange. Mass has no part at all in these calculations, temperature is accurately obtained for all points of interest. The speed of light in units of km/s is connected to the calculations.

The model seems to cover the whole earth system state, not only as a planet, but as a planet heated by the sun as it floats in vacuum with energy density $8\pi G$. Earth mass can be ignored in all internal relationships.

Method

I will use the solar constant, mean values from global measurements and, what was a surprise to me, the energy density of vacuum.

This work was primarily only an attempt to make a personal reference and to understand the internal relations in a better way. I soon realized that it was a successful model and decided to try making it complete, although I am not a professional scientist or have the usual necessary education. I think my lack of education was a helping fact in this case, as I had to build the model from the basics.

The energy density of solar radiation at TOA is initially set to $\sim 1370 J/m^3$. Time is not included, the solarconstant will be transformed to energy density in $\mathrm{J/m^3}$as soon as it enters the atmosphere.

I will not use flux from surfaces to distribute energy, I will instead divide by volume and try a different method, as uncertainty is a built in element of the climate, causing radiation intensity to vary in level. My initial thought was to make a model of energy density independent of time.

To distribute a beam of energy from the sun I must account for the geometry of a sphere, irradiated at only half the surface area.

Starting at the simplest level, ignoring everything else than the known mean temperatures and fluxes, the geometry of a spherical cavity is used to distribute the energy throughout the system. No emission or absorption in surfaces is considered.

Using volume for calculation instead of fluxes ignores details of local energy-transfer to achieve a basic frame for idealized calculation.

The result is an equation with a viewpoint from the surface, in relation to OLR and TSI

I will not consider a wave propagating through the atmosphere, I will instead look at what the energy density of the atmosphere and earth would *have to be,* as a reasonable relationship to the amount delivered at TOA. I had to start with nothing else than an empty shell of a sphere.

Surprisingly I found that a spherical cavity is a perfect model of earth`s state when only considering temperature, the solar constant and geometry. Even more surprising was the obvious thermal resonance of earth. Considering the results, all available energy is represented in temperature, mass and time does not affect the energy of earth.

Results

The system was easily defined as a standing wave in perfect balance from the ratio $2 * 4/3^2$ at the surface.

I found that the spherical cavity contains a standing wave of energy, and when the solar constant is 1370W, the internal relationship comes out as:

$$2\left(\frac{4}{3}\right)^2 \sigma T^4 + \frac{1}{3}\sigma T^4.$$

The amount of energy in the ground of the hemisphere facing the sun, ***must be*** at a minimum of 770.625J/m^3, to have a surface temperature equal to a mean energy density of 385.3125J/m^3, which is slightly less than the commonly mentioned mean of ~390W/m^2.

The speed of light divided by the solar constant is 7πG

$$\frac{c}{km/s} = 2\left(\frac{4}{3}\right)^2 \sigma T^4 * 7\pi G$$

The energy density of vacuum

When taking a closer look, it became clear that he node for the wave is the energy density of vacuum: $8\pi G$.

Solar energy is balanced to vacuum through earth as $2\ \sigma T^4/\pi = 8\pi G$.

The surface temperature relationship to solar energy and vacuum energy density is:

$2 * 4\pi G * \pi - \pi^4$ for earth surface and $\frac{1}{2} * TSI = 7\pi G * \pi + \pi^4 = 8\pi G * \pi$.

$7\pi G = 216 J/m^3$

$7\pi^2 G = {\sim}680 J/m^3$

$8\pi G = 246 J/m^3$

$8\pi^2 G = {\sim}775 J/m^3$

Dividing the speed of light by $2\sigma T^4$ or $8\pi^2 G$, using units of km/s, was found to give σT^4, the surface mean temperature of earth. C is involved in the relationship between the amount absorbed of solar energy to the surface temperature, as well as the energy density of vacuum.

$299792/8\pi^2 G = 385 J/m^2$

I can use only c and π in varying ratios to find the energy density of the most interesting parts of the earth system. It shows that the relationship between the vacuum and the solar constant becomes an entirely relative property of earth.

It seems like π and $8\pi G$ is at the center of the internal relationships of energy density on earth.

From $8\pi G = 2\sigma T^4/\pi$ I get:

$G = 9.82$

$\sigma T^4 = 386.678 J/m^3$.

If $TSI = 1370 J/m^3$, then $((c/1370) + \pi G) = 784/\pi$

$\sigma T^4 = 392$ and G = 9.93

If $G = 9.82$ and $I = solar\ constant$:

$I = 14\,\pi^2 G$

$I/2 = 7\pi^2 G$

$I/2 + \pi^2 G = 8\pi G * \pi$

$I/4 = 8\pi G + \pi^2 G$

$\sigma T^4 = 4\pi^2 G$

$\sigma T_{TOA}^4 = 4\pi^2 G/3$

$\sigma T_{TOA}^4 = 4\pi G$

$8\pi G = effective\ temperature\ of\ earth$

It seems like this method is capable of producing all of the values from my first equation, where I used the spherical, massless volume as a receiving cavity to find the correct distribution of energy.

The results if πG is replaced with π^3, is very similar.

And the observed effective temperature, the “color temperature” of earth, seems to relate to the vacuum energy density.

Conclusions

The new ideas coming from the assumption that this is a model that is correct, are many and exciting.

Thermal resonance show that the energy density of earth does not relate to it´s mass.

The numbers I provide show a different way to model energy distribution inside the earth system, The way it relates to surrounding space and the sun is a convincing argument that our understanding of earth and temperature can be improved.

The results I present here was not expected at all.

I hope others find this useful.

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References:

My calculator

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