Earth as a spherical volume with a shell absorbing thermal radiation

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Abstract

Energy, mass, gravity and heat are united using only observed mean values. Gravity is a conservative force of mass being under stress from electromagnetic radiation in a scalar field. Earth state is balanced by solar radiation, emitted radiation and the internal state, using only the fourth power of temperature in Kelvin. Heat transfer explain the distribution of energy density and gravity is shown to be equal to surface temperature:

$$g = \sqrt{\frac{TSI - 4\sigma T_{effective}^4}{4}} = \sqrt{\frac{\sigma T_{surface}^4}{4}}$$

In the heat transfer equation the surface emitted intensity is entering the equation as a potential of approximately -385W/m^2 equal to 288K. If the units for stress/pressure/thermal resistance is used for gravity, N/m^2, this value of -385W/m^2 is balancing emitted heat by attracting mass with a force displacing it at a power of 385W/m^2, or to be more exact, 384.16W/m^2.. Gravity is proposed to be a conservative force keeping mass and the expansion from heat balanced.

All points of interest above the surface now have a clear independent relationship which needs only one number, absolute temperature.

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Thermal energy density distribution and total balance of energy and gravity of a system consisting of two concentric spherical volumes:

$$TSI = 1361 W/m^2$$

$$P_{net} = A\sigma(T_1^4 - T_2^4)$$

$$TSI/(4/3)^{\wedge}2 = 2\sigma T_{surface}^4$$

$$Q = \frac{\sigma\left(T_{TSI}^4 - \sigma T_{surface}^4\right)}{4} = \sigma T_{effective}^4$$

$$Q = \sigma(\sigma T_{surface}^4 - \sigma T_{effective}^4) = \sigma T_{tropopause}^4$$

$$\sigma T_{surface}^4 = \sigma T_{effective}^4 + \sigma T_{tropopause}^4$$

$$TSI/(4/3)^{\wedge}2 = \sigma T_{surface}^4 + \sigma T_{effective}^4 + \sigma T_{tropopause}^4$$

Total irradiance zenith (diffuse + direct)

$$Q = \sigma T_{TSI}^4 - T_{effective}^4 = 1116 W/m^2$$

Direct irradiance zenith

$$TSI/(4/3)$$

Blackbody Radiative Balance

$$TSI/4 = TSI - (TSI/4/3)$$

For emitted radiation from the surface, we need to balance it to the square, which is the source intensity: $I = 4\sigma T_{surface}^4$. The incoming energy from the sun is balanced to $765W/m^2$, and from the known mean addition of only 90mW from internal generation we can assume near perfect equilibrium of the solid sphere earth. That means that a nonparticipating spherical shell must contain a minimum of twice that amount, to balance incoming and outgoing radiation, and a body in equilibrium will behave in a similar way. The minimum internal energy then is $2 * 765W/m^2$.

If we use the units for stress/pressure/thermal resistance and treat gravity as a radiated force acting to balance thermal radiation, gravity have the function of balancing the inflation of heat into a steady state conserving mass. With units for stress/thermal resistance, N/m^2, and inverse square law:

$$g = m/s$$

$$g^2 = m^2/s$$
$$f = g = \sqrt{(f/4)}$$

$$F/4\pi r^2 = \sqrt{g^2/4} = 9.8 Nm/s = 9.8 W/s = \sqrt{\frac{\sigma T_{surface}^4}{4}}$$

The *hemispherical total emissive power* of a blackbody radiating into vacuum is then

$$E_b = \int_0^\infty E_{\lambda b} d\lambda = \int_0^\infty \pi I_{\lambda b} d\lambda = \pi I_b = \sigma T^4$$

If we use the relationship:

$$\pi I_b = \sigma T^4$$

There is another solution:

$$\sigma T_{surface}^4/\pi = 124 W/m^2 = \sigma T_{tropopause}^4$$

$$2\sigma T_{surface}^4/\pi = 243.5 W/m^2 = \sigma T_{effective}^4$$

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Conclusions & Discussion

The blackbody hemispheric intensity gives another relationship than the concentric spheres which is slightly different. They are both a good fit.

There is no greenhouse effect, there is only temperature and the consequences of it. Temperature is the signal, it is the only force/energy we observe in the universe, and it is independent of space and mass. My conclusion is that the temperature is the first dimension in a universe of 1+3 dimensions. The one-dimensional signal then expands in space through three dimensions of time, which is called space. The difference between the signal and space three dimensions is time passed that defines the expansion. This turns the common definition of reality on its head, we instead have one dimension of energy that expands in three dimensions of time. Suddenly the expansion of the universe makes sense and its nature becomes logical in relation to observation and energy.

Everything that we observe is in the past, since an observation consist of measurement of a continuously changing state. The measured state is already in the past when observed. This can explain entanglement, since the state is instantaneous and equal to temperature, while observation is in the inflation into the past, as the absorber of the transfer of energy emitted according to the internal state entangled by the instantaneous signal of thermal energy.

Insolation and the emitted intensity throughout the system has to be balanced to the internal state at any time, otherwise rapid overheating or cooling would happen. All emission in the volume above the surface plus the surface temperature combined with the conservation through gravity as a stress/thermal resistance, has to be accounted for at any single moment.

Future investigations would include comparison with calculations of gravity and radiation on astronomical scale. The use of stress units for gravity seems to be able to account for dark matter with no addition of forces except known and observed theory.