

## Lorentz factor correction of the grand unified field equation

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### Abstract

I have proposed a grand unified field equation to unify gravity field, spinity field, electric field, and magnetic field. However, this equation is used only for rest reference frame. If the field source is moving, we should use Lorentz factor to correct it. Here, I write two special occasion about this correction. One situation is that acceleration is perpendicular to velocity. The other situation is acceleration is parallel to velocity. The corrected formula were listed in the manuscript.

### Main text

The grand unified field equation was provided as:

$$B * A * S * E = \frac{6\pi\sigma T^4}{\varepsilon \left( \frac{r^3}{R^3} \right) t} = \eta H * c^2$$

B magnetic field, A gravity field, S spinity field, E electric field, H Heat field

This formula is suitable if field source is in the rest reference frame. If the field source is in the moving reference frame, we should use Lorentz factor to correct this equation.

If we are in the earth to observe the sun as field source or we are in the solar system to observe the milky way galactic core as field source. Because this is involving the circular motion, the acceleration is perpendicular to velocity. Then, we need to use  $\gamma^4$  to correct the both right side and left side of the above equation. Thus, the equation is not changed as:

$$B * A * S * E = \frac{6\pi\sigma T^4}{\varepsilon \left( \frac{r^3}{R^3} \right) t} = \eta H * c^2$$

However, if we are in the milky way galaxy to observe another galaxy which is moving far away from us, this is a linear motion with acceleration is parallel to velocity. Also, we should consider the Doppler effect on the temperature. We should multiply  $\gamma^6$  in the left side of the formula and multiply  $\Gamma * (1 - 1/2 \beta)$  in the right side of the formula. And we know the estimation:

$$\beta = 1 - 1/2 \gamma^{-2}$$

So the right side temperature totally should multiply by  $(1/2)^4 * \Gamma^{-4}$

Finally, there is a  $\Gamma^{10}$  correction for the final formula:

$$B * A * S * E * \gamma^{10} = \left(\frac{1}{2}\right)^4 * \eta H * c^2$$