

Is the energy of Universe above the zero?!

Dmitri Martila (eestidima@gmail.com)

Independent Researcher

Lääne 9-51, Tartu 50605, Estonia

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Abstract

Dust-cloud collapse gives in Møller's formula the $E = 0$ as energy. Therefore, if such cloud flies towards a wall, the thermal energy won't be released after the impact. But warm must be (cloud of machine gun bullets).

If one shuts the bunch of bullets, let them form spherical cloud (dust-like cloud with corrected mistake in the metrics: [2]). The energy of cloud is zero, according to Møller's formula [1]. Then when this cloud hits a wall, the temperature of the wall increases (they are bullets!), thus, the energy is not zero. We have paradox, the solution, which I propose, is to consider the Møller's zero four-momentum P^ν of the cloud as the mathematical entity without the meaning of the four-momentum. This math entity happens to conserve.

I repeat. Møller gives zero as the four-momentum of the system: $P = (0, 0, 0, 0)$. Thus, the moving cloud has no energy. But cloud hits the wall and energy is there. Conclusion: Møller has got not the four-momentum.

One can study the case by transformation into the non-comoving system: $X = x - vt$, and find the Møller's E . If it is zero, then we have major discovery: the "wiseman" Hawking is wrong saying, what the energy of Universe is zero.

Let us see. Take the flat Friedman Universe with metric

$$ds^2 = dt^2 - a(t)^2 (dx^2 + dy^2 + dz^2)$$

Let us move the Cosmos along the x-axis: $x = X + vt$. Thus, the metric in the reference to impact wall $X = 0$ is

$$ds^2 = dt^2 - a(t)^2 ((dX + v dt)^2 + dy^2 + dz^2).$$

And we have: $E = 0$ in the Møller formula.

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- [1] Florides PS. 2009. On the Tolman and Møller mass-energy formulae in general relativity. J Phys: Conf Ser. 189:012014.
- [2] Trevor W Marshall, Max K Wallis. 2010. Journal of Cosmology 6:1473-84. Available from: <http://journalofcosmology.com/MarshallWallis.pdf>