

Modern SpaceTime and Mass Definition

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In the article “MST and Planck’s Constant” is used the covariant time component of the 4-momentum to be $P_0 = \text{rest mass}$, that followed from 3D covariant momentum $P_i = 0$, $\{i = 1, 2, 3\}$ to be generally true. By eliminating 3D spatial momentum from the 4D momentum components P_u , we are left with only a rest mass P_0 , consistent with MST and Planck’s constant. Additionally, MST is Generally Covariant as formulated, and I find is consistent with General Principles of Relativity, so far, to be addressed in a future article.

Here, I’d like to proceed to show $P_0 = \text{rest mass}$, is consistent with ElectroMagnetically stored energy.

Let charges “a” and “b” conventionally store a quantity of electrical potential rest energy (and thus rest mass), in a charge couple, as, $\text{energy} = a * b / r$, and set the definition of radius “r” as defined by a light signal given by $r = ct = x^0$. I’ll put that together in,

$$P_0 = a * b / x^0. \quad (1)$$

By way of comparison, in the article “MST and Planck’s constant” was used,

$$h = P_0 x^0 = n * \text{ERG} * \text{SECOND}, \quad (2)$$

and those together yield the proportion, $h = a * b$, consistent with “h” being units of action, and so is the charge product “ $a * b$ ”.

To summarize; I’ve noticed in theoretical treatise’s a lack of a common definition as to what is mass, specifically the ‘Laboratory Mass’ that we call ‘rest mass’. Our current definition uses a piece of bulk matter located in Paris, that is awkward.

I propose a definition of ‘Laboratory Mass’ within the 1983 MST standard, based on the component “ P_0 ” that is General Covariant, and consistent with Planck’s constant and EM energy.