

Re: GR ?

Source: <http://sci.tech--archive.net/Archive/sci.physics.relativity/2005-07/msg01133.html>

- *From:* "Significant Zero" <paulpsremove@xxxxxxxxxxx>
 - *Date:* Sun, 17 Jul 2005 14:52:57 +0100
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"Tom Roberts" <tjroberts@xxxxxxxxxxx> wrote in message
[news:XFiCe.4226\\$Ih7.2317@xx](mailto:news:XFiCe.4226$Ih7.2317@xx)

| Significant Zero wrote:

| > ENERGY:-- A measure of a system's ability to do work. [...]

|

| That is an old and often not very useful definition.

Fair enough its the one used in my text books and physics dictionary but I'm not one to hang onto the old if a better model comes along, as long as its cheap enough in brain power {:-)

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| In modern physics, energy is the conserved Noether current corresponding
| to a time translation. In systems without time translation invariance,
| energy is not conserved, and loses much of its usefulness.

A point I am interested in Tom, thanks. So do you think that in GR time translation is invariant ? and can you conceptualise a system in which time and distance proportionate variance produced a conserved energy situation ? and would this have any relevance to GR ?

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| In cases where your definition can be used, the new one yields the same
| answer.

|

| > CHARGE :- A property of some *elementary particles that gives rise to an
| > interaction between them and consequently to the host of material
| > phenomena described as electrical. [...]

|

| Such circular "definitions" are not useful at all.

>From a modern physics dictionary Tom

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| In modern physics, charge is the conserved Noether current for a global
| gauge transformation. There are no systems which do not have invariance
| under such transforms, so charge is always conserved.

|
|
|> NOETHER'S THEOREM
|> Noether's theorem Every continuous symmetry under which the
|> *Langrangian (or *Hamiltonian) is invariant in form is associated with a
|> "conservation law. [...]

| Yes. This is one of the most powerful concepts in theoretical physics.

But can a *Langrangian (or *Hamiltonian) always be considered as being applied to a continuous symmetry in GR.? Its certainly confusing to me as it appears that a Langrangian is based on Pythagoras's and Euclidean geometry which seem incompatible with GR.

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|
| Tom Roberts tjroberts@xxxxxxxxxxx

• *Follow-Ups:*

- ◆ Re: GR ?
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• *References:*

- ◆ GR ?
◇ From: Significant Zero
- ◆ Re: GR ?
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◆ ***Re: GR ?***

◇ *From:* Significant Zero

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◇ *From:* Tom Roberts

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