

## Re: Gravitomagnetism

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**From:** Louis Nielsen ([Louis\\_N\\_at\\_edu.herlufsholm.dk](mailto:Louis_N_at_edu.herlufsholm.dk))

**Date:** 10/17/04

Date: 17 Oct 2004 11:57:43 -0700

Robert and Ziggi please read the following:

A Maxwell-analogous Gravitational Theory with two gravitational fields.

By Louis Nielsen Denmark <http://www.rostra.dk/louis>

More than thirty five years ago (in the sixties) I suggested and derived a Maxwell-analogous gravitational theory with two gravitational fields. The two fields are the 'gravito-static' field of Newton and the 'gravito-magnetic' field, which is a gravitational rotation-field. The two fields exist around matter in relative motions.

In my treatise I show that the four field equations, which must be fulfilled by the 'gravito-static' field and the 'gravito-magnetic' field, are mathematical identical to Maxwell's electromagnetic equations.

I show that the four field equations and the 'gravitational Lorentz-force equation' are a consequence of:

- 1) Newton's gravito-static force law,
- 2) The transformation equations for positions, times, velocities, and forces as given in the special theory of relativity,
- 3) The assumption that the 'gravitational mass' is Lorentz invariant.

In the equations I introduce a quantity, the 'gravito-magnetic permeability' which is coupled to the 'gravito-magnetic' field. The 'gravito-magnetic permeability' has connection to the gravitational constant of Newton and the propagation velocity of the gravitational fields.

The velocity of propagation of the gravitational fields can be assumed to be equal to the velocity of light, in accordance with the made observations.

Decreasing cosmic gravity.

According to my quantum–cosmological theory (see my treatise) Newton's gravitational 'constant' is not a constant but is decreasing along with the expansion of the Universe.

If the propagation velocity of the gravitational fields does not change in cosmic time then it has as a consequence that also the 'gravito–magnetic permeability' is a decreasing quantity along with the expansion of the Universe.

In our epoch the 'gravito–magnetic' fields are extremely small around moving bodies from daily life, and they are difficult to measure. But around massive bodies with great velocities there exist measurable 'gravito–magnetic' fields. In earlier epochs of the cosmic evolution of the Universe the magnitude of the 'gravito–magnetic' fields were higher. As we look back in time to distant objects in the Universe, these objects moves in more intense and strong cosmic 'gravito–magnetic' fields, which give a lot of astrophysical consequences and which can give explanation of different observations.

You can study my derivation of the gravitational field–equations in part 6 of my treatise:

<http://www.rostra.dk/louis/>

Best regards Louis Nielsen, Denmark

robert bristow–johnson <rbj@audioimagination.com> wrote in message news:<BD91ABA2.F73%rbj@audioimagination.com>...

> in article ckh4d2\$6fb\$1@titan.btinternet.com, Ziggi at one\_ziggi@hotmail.com

> wrote on 10/12/2004 14:45:

>

>> *This is going to sound like a very bizarre and possibly insane question, but*

>> *indulge me if you can.*

>>

>> *Ok, so I was thinking the other day: "Would it be possible to write down a*

>> *set of differential equations for some field that, in flat space, looks*

>> *kinda like EM, but it curved space has a gravity term/component? Sort of*

>> *like the way a magnetic field at zero velocity looks partially electric at 0*

>> *< v < c".*

>>

>> *I know it's a bit of an odd question, but I was curious as to how one would*

>> *conruct such a theory and what it would look like. Answers on a postcard*

>> *:p*

>

> *i don't see it as an odd question at all. i've been thinking about it*

> *myself for as long as i understood (as best as a "lay" physiker can – i'm an*

> *electrical engineer so that might give you an idea of the limits of my*

> *physics expertise) how Electromagnetic forces could be derived from*

> *Electrostatic forces with Special Relativity taken into consideration. i*

> *have thought "Why not do the same for gravity? They are both inverse–square*

> *forces and have a velocity of propagation of c, so why not?" folks on this*

sci.math: Re: Gravitomagnetism

- > newsgroup haven't been too impressed and that's fine with me.
- >
- > Anyway, there is a name for this theory and it's called
- > "Gravitoelectromagnetism" (GEM) and there isn't yet a Wiki page for it yet.
- > This GEM theory has counterparts to Maxwell's Equations that look just like
- > Maxwell's Equations (and the Lorentz force equations) with "q" replaced by
- > "m",  $1/(4\pi\epsilon_0)$  replaced by  $-G$  (just as it is in the Coulomb force
- > law to get to Newton's law of gravitation) except that the magnetic flux in
- > GEM is expressed as "B/2" instead of "B". There are at least two papers:
- >
- > [http://arxiv.org/PS\\_cache/gr-qc/pdf/9912/9912027.pdf](http://arxiv.org/PS_cache/gr-qc/pdf/9912/9912027.pdf)
- >
- > <http://www.iop.org/EJ3-Links/26/B2PcnrMQ9Or.dG8lppV.HA/q01911.pdf>
- >
- > that derive these GEM equations from GR (Einstein's Field Eq.) for flat
- > spacetime.
- >
- > I haven't understood the B/2 scaling thingie (they say its because gravitons
- > are spin-2 particles) because it seems like, at velocities of  $c/2$ , the
- > gravito-magnetic forces completely counteract the gravito-static force and
- > that should not happen (from the p.o.v. of Special Relativity) until the
- > velocity is close to  $c$ . at least that's how this amateur looks at it. i
- > wish the experts here could give me an explanation of that seeming
- > contradiction.
- >
- >> ps, spare no technicality in your response... I'm not exactly a "lay" person
- >> :)
- >
- > but i am.
- >
- > r b-j