

Re: gravitational-wave sources (was: Re: Is temporal sign ambiguity inherent in Einstein's general relativistic field equation?)

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- *From:* Joe Fischer <efischer@xxxxxxxxxx>
 - *Date:* Tue, 10 Jan 2006 01:26:40 -0500
-

On Tue, Jonathan Thornburg wrote:

>In sci.physics.research Joe Fischer wrote:

Sorry, I didn't realize the message I replied to was cross posted to s.p.research.

>> I would like to state how I think LIGO should have been tested from the beginning.

>>

>> A perfectly level rail line should have been built running toward and away from the end of the arm, and a rail car propelled by rockets used to accelerate a large mass $\sim 10E+6$ kg, back and forth as rapidly as possible.

>

>Unfortunately, this would

>(a) produce large ground vibrations which might well interfere with LIGO's operation,

I was assuming that a smooth rail line would not cause too much vibration with only rocket power. The cost would be so small compared to the total cost of the program that it should provide some useful data. It is not too late to do if nothing like has been tried.

>(b) produce large *Newtonian* gravitational effects which would interfere with LIGO's operation, and

Aren't all observed effects up to now those resembling Newtonian effects?

>(c) produce a gravitational-wave signal which is *vastly* too small for LIGO to detect. A rough approximation to the emitted gravitation-wave power is
> $P_{GW} = P_{internal}^2 / P_0$

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- > where $P_0 = 4e52 \text{ Watts} = (2e5 \text{ solar masses} * c^2) / \text{second}$
- > and P_{internal} = the non-spherically-symmetric power flow in the
- > emitting system
- > If you work it out, you'll see that this is WAY below LIGO's
- > sensitivity.

Sorry, I don't understand what could have any kind of interaction involving $2e5$ solar masses / second.

I purchased Joe Weber's prize winning paper when I heard about the Gravity Research Foundation publications, and I did not see much that I understood, so please forgive me.

- >> I have no idea why black holes or neutron stars are talked about,
- >> ordinary binary stars would seem to merge at least as easy as any other
- >> because of their size and atmospheric drag, plus ordinary stars should
- >> flex and transfer material easier than dense stars.

>

- >Black holes or neutron stars are 'talked about' because they are
- >much stronger gravitational-wave sources than ordinary binary stars.
- >This is because they are (or can be) moving much faster, in much
- >closer-together orbits. I think the gravitational-wave signal
- >grows as the 5th power of the orbital frequency, so a neutron star
- >or black hole binary shortly before merger, with an orbital frequency
- >of 100 Hz or more, produces a LOT more gravitational-wave signal
- >than a classical binary star (with an orbital frequency of 0.0001 Hz
- >or lower).
- >ciao,

That does sound something like the Joe Weber paper describes, but it is not clear to me what the signal is supposed to consist of.

If gravity is purely geometrical with no "flux" of interacting energy involved, I don't understand what the "signal" of gravitational radiation would be.

This suggests to me that LIGO, etc., experiments are more to test if gravitational radiation exists, yet they are built as if they will be observational instruments to observe known phenomena.

The reason for my pessimism is that I don't think there are any "effects" of gravity other than those that have been observed as "changes in motion".

Taking the experiments to orbit before having some success with ground based instruments seems a little too optimistic.

Apparently LIGO data is being analysed, and I can't imagine why there should be data which is not of the gravitational wave signal type.

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I see no reason for me to have any further comments which can only show how little I understand. :-)

But thanks for the reply.

Joe Fischer

• ***Follow-Ups:***

- ◆ ***Re: gravitational-wave sources (was: Re: Is temporal sign ambiguity inherent in Einstein's general relativistic field equation?)***

◇ *From: Sue...*

- Prev by Date: ***Re: Explain the Law of conservation of matter and energy***
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