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Detection of Gravitational Waves B

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See Unified Absolute Relativity Theory at:

http://www.wbabin.net/saraiva/saraiva105.pdf

http://www.wbabin.net/saraiva/saraiva223.pdf

The usual method of detecting gravitational waves is very bad.
First, we don't know if macroscopic space changes of length with GW.
Second, this effect is 2×10^{8} times smaller than the detection of GW with accelerometers.

Effect of the Moon for $\Delta D = 1m$

Usual method:

$$x = x_0\sqrt{1-v^2/c^2} \quad ; \quad x_0 = 100m$$

$$v = \sqrt{\frac{GM}{D}} \quad ; \quad \Delta v = \frac{1}{2}\sqrt{\frac{GM}{D^3}}\Delta D \quad ; \quad \Delta x = x_0\frac{v}{c^2}\Delta v$$

$$\Leftrightarrow \quad \Delta x = x_0\frac{GM}{2c^2D^2}\Delta D$$

$$M = 7.3\times10^{22}kg \quad ; \quad D = 3.85\times10^{8}m$$

$$\Delta x = 7.3\times10^{-22}m$$

Accelerometer method:

$$g = \frac{GM}{D^2} \quad ; \quad \Delta g = \frac{2GM}{D^3}\Delta D$$

$$\Delta g = 1.7\times10^{-13}ms^{-2}$$

$$\Delta g / \Delta x = 2.3\times10^{8}$$

Gravitational waves are not ripples of the spacetime because it doesn't exist.
They are waves of variation of acceleration.

In the lab:

$$M = 1kg \;;\quad \Delta D = 1m \;;\quad D = 0.1m$$

$$\Delta g = 1.3\times10^{-7}$$

It's possible and easier to produce and detect GW in a lab.

Binary system of black holes:

$$M = 2\times10^{30};\quad R = 4.8\times10^{6};\quad D = 1\times10^{19}$$

$$\Delta g = 2.56\times10^{-30}$$

Our balance sense can detect GW. It detects differential variations of acceleration.
The virtual photons are detected as forces.

Graviton

Frequency of the graviton:

$$f = f_M = \frac{c}{\sqrt{k}} = 2.1672\times10^{25}\,Hz$$

Phase speed for the moon:

$$w = \sqrt{\frac{hf_M}{M}} = 4.435\times10^{-16}\,ms^{-1}$$

Group speed:

$$V = \frac{c^2}{w} = 2.03\times10^{32}\,ms^{-1}$$