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Any hypothesis, in order to become a theory, must be confirmed by experiment. Recently, devices have appeared that can be used to try to confirm the existence of a chronofield in our universe. Two possible experiments are considered that can confirm this.

1. Introduction.

According to the chronofield hypothesis [1, 2, 3], any kind of matter in our universe exists due to the energy of the chronofield. In the absence of matter, the energy of the chronofield is spent on the expansion of space. In the presence of any kind of matter, the energy of the chronofield is spent on ensuring the existence of this matter and the expansion of space in this area slows down.

This is what leads to a slowdown in the speed of the clock and gravitational attraction. If, in the absence of gravitational masses, slowing down of the clock rate and the presence of gravitational influence in the area of any energy process are established, this will confirm the hypothesis of the existence of a chronofield.

2. Experiment to slow down the speed of the clock.

The deceleration of the speed of a clock in a gravitational field is measured using atomic clocks. In [4], special atomic clocks were used to measure this phenomenon. This apparatus measured the vibration frequency of strontium-87 atoms. The atoms were arranged vertically in the form of a "stack" and the gravity of the Earth caused a shift in the vibrational frequencies of the atoms at different heights. This made it possible to detect the difference in the speed of the clock in the upper and lower parts of the "stack" of strontium-87 atoms.

Perhaps such clocks can also be used to measure time dilation near an energy process in the absence of gravitational masses. It is desirable that the energy process has a minimum gravitational mass. As a source of energy process, you can use a conventional electric incandescent lamp.

Such a lamp must be placed over a "stack" of strontium-87 atoms and the vibration frequency of atoms measured with the lamp off, and then compared with the vibration frequency when the lamp is on. In order to exclude the influence of power sources and the lamp itself on the atomic clock, everything must be carefully shielded. You can experiment with lamps of different power and compare the results.

If clock slowdown is registered, this will confirm that any kind of energy in the universe reduces the energy of the chronofield in a particular area. In other words, any energy in the universe exists due to the energy of the chronofield and thereby slows down the speed of the clock.

3. Experiment on gravitational interaction.

Determining the gravitational effect in the energy process is much more difficult than time dilation. In [5], scientists managed to fix the gravitational attraction of golden balls weighing 90 mg, spaced at a distance of 1 mm from each other. One of them moved with a frequency of 12.7 MHz, creating a periodic gravitational effect on the second.

This scheme can also be applied to study the energy process. Instead of one of the balls, install an electric incandescent lamp and periodically turn it on and off. Perhaps this will lead to the creation of a periodic acceleration for a ball suspended on a free balancer.

The only drawback of such an experiment would be the insufficient energy of the electric lamp. It may not be enough to create the necessary gravitational effect. If a more powerful source of energy is used, for example, an electric arc, then there will be a problem with the screening of the electromagnetic radiation of such an arc.

In [6], the possibility of using the method of "optical capture" to determine the gravitational effect on micro-objects is considered. This scheme of the experiment would make it possible to determine even insignificant gravitational effects. But such a scheme has not yet been implemented.

4. Conclusion.

If such experiments confirm the gravitational effects of energy processes, then it can be argued that any kind of matter can be represented as energy, which is provided by the energy of the chronofield, covering our entire universe.

Thus, gravity is a decrease in the energy of the chronofield near any kind of matter and, due to this, a decrease in the increment of space. Accordingly, gravitational waves are chronowaves that can be detected using atomic clocks.

Unfortunately, the author does not have the opportunity to conduct such experiments. If someone decides to carry out such experiments, the author would be grateful to be informed of the results.

References.

[1] В.Е. Юмашев. Время и Вселенная. НиТ. 2001.

[2] В.Е. Юмашев. Напряжённость хронополя, или как обнаружить гравитационную волну. НиТ. 2002.

[3] В.Е. Юмашев. Фазовые состояния вселенной. https://www.docsity.com/ru/fazovye-sostoyaniya-vselennoy/1378704/

[4] Bothwell, T., Kennedy, C.J., Aeppli, A. *et al.* Resolving the gravitational redshift across a millimetre-scale atomic sample. *Nature* **602**, 420–424 (2022). https://doi.org/10.1038/s41586-021-04349-7.

[5] Westphal, T., Hepach, H., Pfaff, J. *et al.* Measurement of gravitational coupling between millimetre-sized masses. *Nature* **591**, 225–228 (2021). https://doi.org/10.1038/s41586-021-03250-7.

[6] https://www.nist.gov/news-events/news/2010/08/glasperlenspielnist-scientists-propose-new-test-gravity.