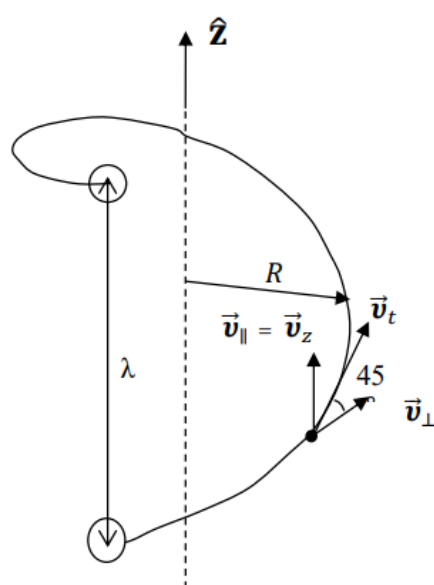


# Review of: "The structured vacuum theory"

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Potential competing interests: No potential competing interests to declare.

## Screen 1.



**Fig. 1** The one-turn section of the helical streamline is the most primitive resonant structure carrying equal amounts of kinetic and potential energies. The kinetic and potential energies are carried by the longitudinal and transverse velocity components, respectively.

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Why kinetic energy should be carried by longitudinal waves of vacuum and potential should be carried by longitudinal waves there is no argument, there is no reference, this is a pure idea and has no scientific validity, is it an unproved presumption?

## Screen 2:

of two helical streams. In this case, such modes are symmetric and asymmetric vibrations of the double-helical structure. In our model, the decomposition of the perturbed superfluid double-helical flows to symmetric and anti-symmetric flow patterns acquires deep physical significance of decomposition to electromagnetic and gravity energy carriers, respectively. In addition, the velocity vector of these propagation modes supported by double-helices may be decomposed into longitudinal and transverse components. As a result, all the excitations of the system, which is our universe, are divided equally between four fundamental categories of energy:

- kinetic component of gravitational energy;
- potential component of gravitational energy;
- kinetic part of electromagnetic energy, and finally
- potential part of electromagnetic energy.

In double-helical flows of the unperturbed vacuum, which is experimentally undetectable and traditionally neglected in modern physics, survives only in anti-symmetric gravitational mode. In contrast, in the vacuum excited states, which are the focus of our physical explorations, the velocity vector distribution along each helix is subject to deformations, and in the general case must be presented as a sum of four vector components:

This above is all hypothetical, it has no references; it has no experimental support. What is “symmetric” vibration is not explained in detail, what is “antisymmetric” vibration is also not explained.

The term “gravitational energy” is invented, with no deeper explanation, its kinetic and potential components are not well-defined, and there is no scientific evidence these phenomena exist in physical reality. We cannot build physics theory on ideas that have no experimental evidence.

The term “kinetic part of electromagnetic energy” is invented, with no deeper explanation, and there is no scientific evidence these phenomena exist in physical reality. We cannot build physics theory on ideas that have no experimental evidence. The same is valid for the “potential part of electromagnetic energy”.

### Screen 3:

$$\vec{v}_{\text{tot}}^{+/-} = \vec{v}_g^p + \vec{v}_g^k + \vec{v}_e^p + \vec{v}_e^k$$

, where indexes g, e, k, and p stand for gravity (anti-symmetric), electromagnetic (symmetric), kinetic (longitudinal), and potential (transverse), respectively. Eventually, the total velocity vector field of the superfluid streams may be decomposed into four pairs of vector functions, each with its own physical significance:

This equation above has no physical meaning. It is a pure invention.

### Screen 4.

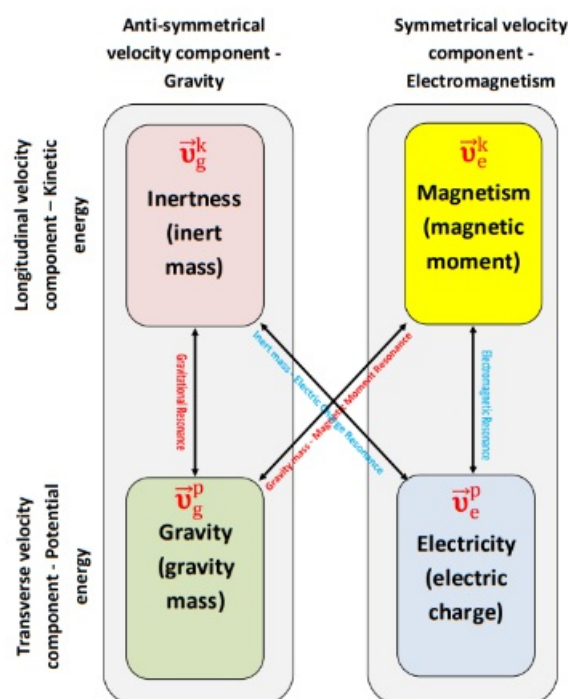


Fig. 2 Conversion of superfluid flow components to energy categories & resonant energy exchanges chart

This figure is linking electromagnetism and gravity and also introduces gravity as propagating and so has velocity. This is the core mistake of all models that would like to relate gravity and electromagnetism. Gravity is not propagating and has no velocity, gravity is embedded in the quantum structure of the vacuum, it is always there, and acts immediately. 1 m above the earth's surface is gravity force, if nothing is there, gravity force will not act, when you put a physical object there, gravity will act on it.

Inertial mass and gravitational mass have the same origin in the variable energy density of the vacuum (superfluid space) and have nothing directly to do with electromagnetism.

Electromagnetism is about the excitation of the vacuum and gravity is about the variable energy density of the vacuum, see the link here: <https://www.worldscientific.com/doi/abs/10.1142/S2424942420500073>

The author is right that all physical phenomena are manifestations of the vacuum. This was also Schrödinger idea: What we observe as material bodies and forces are nothing but shapes and variations in the structure of space.« Erwin Schrödinger. But the “scientific” style of writing is missing in this article.

Physics is based on experiments. It is true that sometimes physicists develop new ideas, and they are verified experimentally later on. But often happened the opposite, namely, that experiments are wrongly interpreted to prove the new ideas right. For example, the bending of light does not prove universal space is curved, bending can be explained by

the different refractive-index of the vacuum that depends on its variable energy density. NASA proved in 2014 universal space is flat, Euclidean, still “curvature” of space is very modern, albeit non-existent. GR has geometrized gravity, despite universal space having a Euclidean shape. Here is the danger of “inventing” new ideas without having experimental support.

I do not see a stable bridge between the theory presented in this article and the existing, well-established knowledge of physics. And the presented model is missing experimental verification.

In my view, new ideas must have deep support in known science or experiment behind them. This is a necessary requirement to progress in physics. This is not the case with this article. I suggest the author rewrite the article in a more “scientific style”, where every new statement will be supported with credible references or experimental evidence.

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