

# Curvature of Space-time

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Abstract: The interaction of mass loops with massless loops has been discussed. The superconducting field has been introduced in correlation with it. One has proved that the curved space-time does not introduce any distinguished reference system.

The problem appears: why does mass curve space-time? In other words: why do mass loops ( $m_0 \neq 0$ ) curve “massless” loops ( $m_0 = 0, v = c$ )?

The answer is given by a very simple experiment [1]: a small ball situated on a woolen cloth (covering an open gap in the upper surface of a box) indents the cloth inwards and then the ball falls into the gap. Next, another small ball rolls into the hollow of the woolen cloth. It is a model of deformation of space(-time) leading to attraction.

There is a superconducting field causing the superconductivity and the superfluidity of whole space(-time).

An interaction of the mass loop with this field curves the texture of loops with rest mass equal zero.

This field is an analog of the gravitational field described above. This field does not introduce any distinguished reference system because it is composed of identical layers moving with different velocities (like unempty vacuum).

The loops with rest mass  $m_0 \neq 0$  and the loops with rest mass  $m_0 = 0$  interact differently with this field. This explains why space(-time) is superconducting and superfluid.

The curvature of space-time does not distinguish any reference system.

Proof:

Non-curved space-time does not favour any reference system. Next, any shape of the curvature tensor is not distinguished from the mathematical point of view; ten functions obtain simply different values of different points.

There are sufficient small surroundings around every point of curved space-time, such that the curvature of space-time in these surroundings differs freely little from flat space-time. And in the flat space-time there is not any distinguished reference system.

Unempty vacuum and its superconducting field keep track of the structure and curvature of space-time.

The curvature of unempty vacuum and superconducting field do not introduce any distinguished reference system either.

However, there are distinguished systems connected with excitations of vacuum, but without these excitations the motion would not be possible at all.

Reference:

[1] J. A. Zakrzewski, private communication