

## ESSAY 122: MAPPING THE VACUUM

In ECE2 theory the vacuum is mapped by the spin connection, which defines the way in which spacetime curves and twists through the Cartan curvature and torsion tensors. In electrostatics and magnetostatics for example the observed electric field strength  $E$  and magnetic flux density  $B$  consist of components that are intrinsic to the material or circuit, and a component that depends on the spin connection four vector. The latter component defines the way in which  $E$  or  $B$  are generated by the vacuum or spacetime. In the Maxwell Heaviside theory (MH) the vacuum has no structure and there is no spin connection.

However, there are many experimental indications of the ability of the vacuum to produce electric and magnetic fields in a circuit. This was proven beyond doubt by UFT311, in which a spin connection was used to explain the data produced by a circuit designed by Osamu Ide. The theory was extended in UFT32 and the circuit was replicated in UFT364. New circuit designs were given in UFT382 and UFT383. So the existence of vacuum effects is now known with precision.

In UFT387 and immediately preceding papers the conservation of antisymmetry has been proven rigorously in various contexts in electrostatics and magnetostatics. Since ECE2 unifies electrodynamics, gravitation and fluid dynamics, the conservation of antisymmetry is a new law of physics in general. In UFT131 it was proven using the commutator method that the MH theory does not conserve antisymmetry, a disaster for the standard model. In order to conserve antisymmetry, spacetime or the vacuum must have a structure that is defined by the spin connection. The vacuum can be mapped through the spin connection. In UFT387 the terms responsible for the interaction of vacuum and circuit were precisely defined. They are the spin connection terms in the well known definitions of  $E$  and  $B$  in terms of the scalar and vector potentials of ECE2 theory. Therefore these terms can be used to describe any circuit that takes energy from spacetime. The theory does this through the existence of a vacuum charge current density, a vacuum  $E$  and  $B$  field, and a vacuum scalar and vector potential.

In ECE2 electrostatics for example the observed  $E$  is defined as the product of the scalar spin connection and the electric vector potential of the circuit. The latter concept does not exist in the standard model of physics (the MH theory). By solving two simultaneous equations, the electrostatic vector potential can be found along with the scalar spin connection. The antisymmetry laws are used to find the vector spin connection of electrostatics. The scalar potential can be found from the Coulomb law for  $E$ . The secondary magnetic field  $B$  of electrostatics is found from the electric vector potential.

In ECE2 magnetostatics, the magnetic vector potential  $A$  of the circuit can be found from the experimentally measured current density, which can also be used to find the charge density through the continuity equation. The vector spin connection is found from the vector potential  $A$ , and the secondary electric field of magnetostatics found by solving for the scalar spin connection with the magnetic  $A$ .

Antisymmetry is conserved in both subject areas: electricity and magnetism, and the spin connection can be mapped in both subject areas for any situation in electricity and magnetism (i.e. electrostatics and magnetostatics).

A circuit such as that described in UFT311 is used to trap energy from spacetime, and the spin connections needed to explain the circuit provide a map of spacetime. It is no longer possible to argue scientifically that energy from the vacuum does not exist, because its theory has been worked out precisely, and has been applied to repeatable and reproducible data. These procedures satisfy all the requirements of Baconian science.

The standard model has been refuted in many ways and is in tatters, and an entirely new school of thought has emerged: ECE Physics.

