

ENERGY DENSITY OF ELECTROMAGNETIC WAVES AND ITS EXTENSION TO ALL ATOMS OF PERIODIC CLASSIFICATION

Franck Delplace

ESI Group Scientific Committee, France

By introducing the concept of fluid, or more accurately, of liquid space-time, nearly ten years ago, Delplace proposed to modify classical quanta equations in order to introduce energy density. In both Planck and Einstein equations for electromagnetic waves, energy was divided by a volume representative of atomic particles scale giving an energy density. This change in quanta equations gave a strong analogy with classical fluid mechanics equations and Planck's law took the same form as a rheological equation of state (stress tensor proportional to rate of strain tensor, proportionality constant being the liquid dynamic viscosity). This result justified introduction of fluid space-time and analogy allowed to consider the ratio of Planck constant to a volume as a dynamic viscosity value (dimensions are the same). The problem was then to define a reference length or scale length representative of phenomena at atomic level. By considering that, energy densities should be identical at both atomic and astronomic (general relativity) scales, Delplace found a reference value of 1 fm. Using a sphere volume of radius 1 fm, allowed electromagnetic stress was produced by electromagnetic waves to be calculated as a function of wave-length. Finally, the approach was applied to all atoms of periodic classification. Huge densities found for atomic material i.e. electron, proton and neutron gave a very high value of stress produced by each atom in fluid space-time. Using a fluid mechanics mixing model, we proposed to characterize atoms by a parameter which depends on atoms orbitales shapes and complexity. This model could be useful for nanotechnologies applications by giving a new way to characterize atoms behaviour and physical properties



Biography

Franck Delplace has obtained his PhD in Mechanics at Nancy University (France) in 1994 and he started his career as Researcher in Fluid Mechanics and Thermal Sciences at INRA. After Honorary Research Fellowship at Birmingham (GB) University, he was included in the American Who's Who in Science and Engineering (1998). He occupied Technical Expert Position in several companies until today at EDF (French Major Electricity Co). In 2011, he reached the Scientific Committee of ESI Group (Leading French Co in Numerical Simulation) as an expert in Fluid Mechanics and Industrial Challenges. His research interests are in both Physics and Mathematics: Fluid Mechanics, Gravity Theory, Field Theories including Quantum Gravity, Riemannian Manifolds and Complex Functions (Euler-Riemann zeta function). He published more than 50 papers in reputed journal and he is a Co-author of publications with famous mathematician H Srivastava. He is also Editorial Board Member of many scientific journals and Chief Editor.

fr.delplace@gmail.com