CERN Cognitive Festival in Georgia

Quantum Circulation – based CERN LHC experiments

Cognitive Unity Fundamentals

Pavle Asatiani (GTU)
The ATLAS Experiment
online at atlas.ch

Mapping the secrets of the universe,
from the Higgs boson to the unknown

EXPECTING THE UNKNOWN

The Physics of the ATLAS Experiment

ATLAS brings experimental physics into new territory. Most exciting is the completely unknown – new processes and particles that would change our understanding of energy and matter. Already ATLAS has discovered the Higgs boson, the source of mass for fundamental particles. ATLAS will learn about the basic forces that have shaped our Universe since the beginning of time and will determine its fate. Among the possible unknowns are extra dimensions of space, unification of fundamental forces, and string theory.

ATLAS is a particle experiment conducted by teams of scientists from 38 nations at the Large Hadron Collider at the CERN Laboratory in Geneva, Switzerland.
W. Harvey’s discovery of blood circulation
Outstanding Norwegian scientist, Nobel Prize Winner, author of the fundamental curl-free circulation applied in the Georgian scientific school to the below mentioned Unity of Knowledge computing – united physical field
For a single particle, wave mechanics requires that the increment of $\chi$ over any closed path must be an integral multiple of $\hbar/m$ so the wave function will be single-valued. (See Vol. I, p. 152, footnote.) In case of cylindrical symmetry the potential is given by $\chi = k\hbar\phi/2\pi m$, where $k$ is an integer and $\phi$ is the polar angle. The velocity has a $\phi$-component given by

$$v_k = (1/r) \left( \frac{\partial \chi}{\partial \phi} \right) = k\hbar/2\pi mr \quad (k = 0, \pm 1, \pm 2, \ldots)$$

Now consider the rotating helium container ($\S 22$); for simplicity we assume $T = 0^\circ K$. Let us imagine that the liquid can be divided into a series of concentric cylindrical regions, characterized by the radii of their boundaries, $r_1, r_2, \ldots, r_n$. In the region $(r_k, r_{k+1})$ we assume the curl-free circulation (4)


Circulation is the unity of changes and their coherence complementarity Norwegian – born American Lars Onsager’s discovery curl – free quantum of circulation (stationary circulation) – based superfluidity in F. London’s monography “Superfluids” unpublished remark of Lars Onsager
N. Bohr’s Unity of Knowledge with the complementarity principle delivered to authors of “Introduction to unitary physical mathematical modelling of information system” - V. Chavchanidze and P. Asatiani in Tbilisi (1961)
COMMUNICATIONS AND FORUM

Introduction to unitary physical and mathematical modelling of information system

Generalizing quantum hydrodynamics of superfluids (Asatiani, 2009) in the language of mentioned wave function and using (Hudson, 1967) correlation between mathematical expectation of wave function and measure of dispersion of random variables Asatiani (2009) gets interesting results. All the latest experimentally proved dispersion theories known for us are covered in a striking way by the unitary two-fluid (superfluid) dispersion model curve in two-dimensional coordinate system: mathematical expectation of wave function depending on measure of dispersion random variables of unitary information system (Platt, 1958; London, 1950; Patashinsky and Pokroyksky, 1975; Prigogine, 1980; Lloyd and Jack Ng, 2005; Lopes da Silva and van Rotterdam, 1982; Hudson, 1967), taking into account frequency resonant origin of these probabilistic dispersion information processes distinctive for our Universe.

The proposed model also shows very interesting application in the early Universe formation description using structural factor of relict helium relating to phonon-photon correlations in information processes and regulating the probabilistic processes of the Universe development as a singular computer (Lloyd and Jack Ng, 2005) in a cosmic symphony of the Universe (Lloyd and Jack Ng, 2005; Scientific American, May 2004).

P. Asatiani and V. Chavchanidze

References


P. Asatiani,
Scientist of First International Category (EU, USA, Japan, Georgia) in Information and Communication Technology Field, professor of Georgian Technical University

Short Communication

Dear Chairman, dear Colleagues,

In the framework of 5th Plenary Session of 5th Georgian-German School and Workshop in Basic Science and interesting reports of professor Bakhtiarov from the USA and professor Tavkhelidze from Georgian Technical University discussing high level problems of machinery mechanics we should like to sound-track relevant short communication obtained at the Georgian Technical University under the leadership of professor A. Prangishvili and protected at Nobel Symposia Committee on 27 October 2011 devoted to the generalization conducted by us of two well-known experimentally proved constants of superfluids physics in quantum mechanics metrology, Nobel Prize-awarded Onsager-Feynman theory of quantized vortexes and Nobel Prize-awarded Bardin-Cooper-Schrieffer microscopic theory of superconductivity and experimentally proved accordingly by Vinen and Josephson:

\[ h = m \delta \dot{\vec{r}}, dR_{corr} \] quantum of velocity circulation and

\[ h = e \delta \dot{A} dR_{corr} \] quantum of magnetic flux circulation,

where \( h \) is Planck's constant, \( \dot{\vec{r}} \) - velocity of superfluid current; \( m, e \) - mass and charge of electron, \( \dot{A} \) - vector-potential; \( R_{corr} \) - correlation (coherence) dimension.

Phenomenological generalization of these constants conducted by us has led us to the uniform physical field as generalized vector-potential field circulation in which quantum of mechanical action, mass and charge of electron together with space and time revealed the same nature being depended through curvature of Maxwell-Einstein space on components of more fundamental experimentally evident classical vector-potential field circulation \( \Gamma = \delta \dot{A} dR_{corr} \).

At the same time this uniform field cancels boundary between classical and quantum mechanics opening may be a way to a new class of advanced computing and machinery engineering based on abovementioned uniform vector-potential field circulation.

Be so kind to fix our communication in the workshop’s discussion documents.

It is especially honorable for me to be today with German physicists because my grandfather, pupil of professor A. Goldhammer belongs to international scientific school of great German physicist's professor Kundt.

Thank you
Discovery of Circulation in Vinen's experiment

The fundamental condition of the circulation quantification has been obtained as follows:

\[ \oint_{L} 2m\bar{v}_x dl + \oint_{L} 2e\bar{A} dl = nh \]  \hspace{1cm} (1)

where \( L \) is contour of the circulation, \( \bar{v}_x \) - velocity of superfluid motion, \( m \) - mass of helium atom, \( e \) - charge of electron, \( \bar{A} \) - Maxwell vector-potential; \( h \) - Planck's constant, \( n \) - order of quantification.
from vortexes (non-stationary circulation) to the unknown Lars Onsager’s discovery – quantum curl-free stationary circulation in E. Andronikashvili’s oscillating – rotating liquid HeII experiments (see P. Asatiani’s Ph. D. thesis “Establishment of Thinking of Fundamental Ideas of Superfluidity” under leadership of E. Andronikashvili.)
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GTU Muskhelishvili Institute of Computational Mathematics
Tbilisi, Georgia
www.gtu.ge

GTU Nuclear Engineering Center
Tbilisi, Georgia
www.cadcam.ge
to “The circulation physical fundamentals of computing and technologies” talk delivered by Pavle Asatiani at SCCTW-2016 organized by CERN and Georgian Technical University (GTU) under scientific leadership of GTU Rector academician prof. Archil Prangishvili and GTU Academic Council – 2015 uniting all latest CERN experiments including LHC data on the basis of quantum circulation paradigm of the united physical field
The paradigm is fully supported by scientists of Europarlament and Ministry of Education and Science of Georgia.
Throughout circulation quantum - based united physical field (Unity of Knowledge) to the united geometry of language signs and physical fundamentals of mathematics (computing) symbols
Landau’s Physical Model of Roton,
Asatiani (1977)
- ATLAS Tracer uses ThreeJS Web Graphics Library as a programmed engine
- Customization of WebGL libraries to suit application requirements
- Application is device and platform independent. That means you can run it on your PC (Win/MAC/Linux) or tablet with minor performance change

- Atlas Tracer API on Mobile Version comes with Virtual Reality mode and simplified geometries for better user experience

Since web browser resources are limited we have to simplify geometries by reducing amount of faces which are flat surfaces that form part of the boundary of a solid object

For the final result ATLAS geometry models go through this cycle
which was successfully examined on space apparatus on a way to “Internet (Globalnet) of Everything” (STOA European Parliament – 2014) and
Throughout conversion of WMD high-performance computing – development of Motorola technology of field MOS transistors (1968-2017) with Dr. N. Magularia, etc. authorship to peaceful MOS transistors with circulation ring geometry

Thank you for attention