

From bilb@mail.eskimo.com Sat Dec 9 12:00:19 1995
 Date: Fri, 8 Dec 1995 11:54:53 -0800 (PST)
 From: William Beaty <bilb@mail.eskimo.com>
 Reply to: freenrg-list@mail.eskimo.com
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 Subject: fnrg: Longitudinal EM Force

From: robert@wwa.com (Robert Stirniman)
 Subject: Longitudinal EM Force
 To: freenrg-list@eskimo.com
 Date: Thu, 7 Dec 1995 16:50:40 -0600 (CST)

Hi all. Some of this information (about Peter Graneau) was posted here earlier this week. A number of related theories and other reference information has been added.
 -- Robert Stirniman

A Longitudinal EM Force May Exist Due to Current Flow

Dr Peter Graneau has conducted experiments which he claims provide a demonstration of departure from classical electrodynamics at high currents levels. A force is found to exist in a direction longitudinal to current flow. Graneau ran a variety of types of experiments with a metal rod conductor immersed in a conductive fluid (mercury, or saline solution). With high amperage passing through the solution the metal rod is found to move in a longitudinal direction. There is no known explanation in conventional EM theory. This force may be similar to the force ($\mathbf{v} \times \mathbf{B}$) that William Hooper finds in a noninductive coil. Or Graneau's longitudinal force may be a coupling between the electromagnetic and inertial/gravitational fields, which is predicted by some 5-D unified EM/gravitational theories -- predicted to result from a divergence of the electric current vector field. Graneau's experiments should be relatively easy to duplicate. I can find no record that anyone has ever done so. Graneau has also discovered apparently anomalous forces and effects in high energy electromechanical devices such as rail guns and induction motors.

In a possibly related development, Rex Schlicher of Albuquerque NM, a former Air Force officer, has been awarded a patent for a device which he claims converts unipolar current pulses into a propulsive force which is longitudinal to the direction of current flow. Schlicher presented a paper about this device at the 31st annual AIAA Joint Propulsion conference.

Schlicher's invention uses a coaxial transmission line structure, at the end of which, the return current diverges into three separate current loops. The device also incorporates copper prisms internal to the coax structure, which are insulated from the transmission line, and provide an eddy current reflection via magnetic induction. In his paper to the AIAA, he describes his device as follows:

A method is presented for generating mechanical spacecraft propulsion from unsymmetrical magnetic induction fields. It is based on an unsymmetrical three-dimensional loop antenna structure driven by a repetitively-pulsed high-current power supply. Antenna geometry is optimized for generating propulsive thrust rather than radiating electromagnetic energy. A magnetic field density gradient imbalances the magneto-mechanical forces that result from the interactions of the internal magnetic induction field with the current in the conductors of the antenna structure.

Also related may be the work of E.G. Cullwick. In his book "Electromagnetism and Relativity", published in 1957, he was one of the first to provide an analysis of the probable coupling between EM and inertial fields. Cullwick realized that Maxwell's equations and most existing theories of electrodynamics assume that the mass of an electron is zero. At Maxwell's time this was a reasonable assumption. But it is well known today that electrons have mass, and therefore an inertial momentum is always associated with an electric current. Cullwick suggested in his analysis that coupling terms between EM and inertia may be very small, but would likely appear sometime in the future as we go to higher current densities. And he was one of the first scientists to predict some of the odd effects which can now be seen with superconductors. Cullwick was also one of the first to identify and attempt an analysis of the relativistic paradoxes and unusual effects which occur in a rotating EM field. His work still stands today as one of the only existing efforts to consider the problem of a rotating EM field.

>From Richard Feynman's Lectures on Physics we learn that there is intrinsic field energy and momentum density associated with a static electro-magnetic field configuration. When there is a change in the magnetic field, this field energy and momentum can be directly converted into kinetic energy and mechanical momentum. Feynman illustrates this with an electromagnetic carousel paradox. In this paradox, a dielectric disk (which is embedded with small charged spheres along its circumference) rotates without any apparent "counter" torque in the system. Before this rotation occurs, the dielectric disk is immersed in a static magnetic field. The subsequent rotation occurs as a consequence to reducing the previously static magnetic field to zero. The angular momentum and rotational kinetic energy comes directly from the initial static magnetic field.

In my opinion, there may be something important underlying all this -- along the lines of unification of the EM and gravitational fields. The kind of experiments identified above are relatively inexpensive to conduct. Yet, no one seems to be working on things like this. Why do most physicists nowadays seem to be either engaged in prohibitively expensive experiments, or in writing enormously complicated theories, which may or may not have any practical value? What became of the small lab and the entrepreneurially oriented experimenter? Historically, these have always provided the foundation of new scientific knowledge.

Regards,

Robert Stirniman (robert@wwa.com)

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Books and articles by Peter Graneau:

AUTHOR: Graneau, Peter.
 TITLE: Ampere-Neumann electrodynamics of metals/Peter Graneau.
 PUBL.: Nonantum, MA. : Hadronic Press,
 FORMAT: ix, 311 p. : ill. ; 23 cm.
 DATE: 1985
 SUBJECT Metals--Electric properties--History.
 Free electron theory of metals--History.
 Electrodynamics--History.
 Electric conductors--History.
 ISBN: 0911767371

AUTHOR: Graneau, Peter
 TITLE: Electromagnetic Jet Propulsion in the Direction
 of Current Flow
 In: Nature
 June 18, 1982 No 295 Page 311

AUTHOR(s): Graneau, P.
 TITLE(s): Ampere force calculation for filament fusion experiments.
 In: Physics letters. a
 MAR 22 1993 v 174 n 5/6 Page 421

AUTHOR(s): Graneau, P.
 TITLE(s): Comment on "The motionally induced back-EMF in railguns".
 In: Physics letters: [part A]
 DEC 02 1991 v 160 n 5 Page 490

AUTHOR(s): Graneau, Peter
 TITLE(s): The Difference between Newtonian and Relativistic Forces.
 In: Foundations of physics letters.
 OCT 01 1993 v 6 n 5 Page 491

AUTHOR(s): Graneau, P.
 TITLE(s): Electrodynamic momentum measurements.
 In: Journal of physics d: applied physics.
 DEC 01 1988 v 21 n 12 Page 1826

AUTHOR(s): Graneau, P.
 TITLE(s): Far-action versus contact action.
 In: Speculations in science and technology.
 1990 v 13 n 3 Page 191

AUTHOR(s): Graneau, Peter
 TITLE(s): Inertia's Riddle.
 Summary: Inertia has been misunderstood ever since the time of
 Galileo says Dr. Graneau.
 In: Electronics world + wireless world.
 JAN 01 1990 v 96 n 1647 Page 60

AUTHOR(s): Graneau, P.
 TITLE(s): Longitudinal forces in Ampere's wire-arc experiment.
 In: Physics letters: [part A]
 MAY 08 1989 v 137 n 3 Page 87

AUTHOR(s): Graneau, P. Thompson, D.S. Morrill, S.L.
 TITLE(s): The motionally induced back-emf in railguns.
 In: Physics letters: [part A]
 APR 30 1990 v 145 n 8/9 Page 396

AUTHOR(s): Graneau, Peter
 TITLE(s): Nonlocal Action in the Induction Motor.
 In: Foundations of physics letters.
 OCT 01 1991 v 4 n 5 Page 499

AUTHOR(s): Graneau, P. Graneau, N.
 TITLE(s): The role of Ampere forces in nuclear fusion.
 In: Physics letters: [part A]
 MAY 04 1992 v 165 n 1 Page 1

AUTHOR: Graneau, Peter.
 TITLE: Underground power transmission : the science, technology, and
 economics of high voltage cables / Peter Graneau.
 PUBL.: New York : Wiley,
 FORMAT: x, 515 p. : ill. ; 24 cm.
 DATE: 1979
 SUBJECT: Electric cables
 Electric power transmission
 Electric lines--Underground
 ISBN: 0471057576

Other References:

"Electric Propulsion Study", by Dr Dennis Cravens of SAIC Corp,
prepared for the Astronautics Laboratory at Edwards Air Force
Base, August 1990, Report No AL-TR-89-040

"Mechanical Propulsion From Unsymmetrical Magnetic Induction Fields"
by: R.L. Schlicher A.W. Biggs W.J. Tedeschi
31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit,
July 10-12 1995

"The Feynman Lectures on Physics" by Richard Feynman, R.B. Leighton, and
M. Sands, Volume II p 17-6

"Nonlinear Electromagnetic Propulsion System and Method", R.L. Schlicher
Nineteenth Power Modulation Symposium of the IEEE, 1990 Page 139

"Classical Electrodynamics" by C.D. Jackson, 2nd Edition, John Wiley and
Sons, New York, 1975

"The Feynman Lectures on Physics" Richard Feynman, R.B. Leighton, and
M. Sands, Volume II p 27-9

US Patent #5142861, "Nonlinear Electromagnetic Propulsion System",
R.L. Schlicher et al. 1992

AUTHOR: Cullwick, E. G. (Ernest Geoffrey), 1903-
TITLE: Electromagnetism and relativity : with particular reference
to moving media and electromagnetic induction / by E. G.
Cullwick.
EDITION 2d ed.
PUBL.: New York : J. Wiley,
DATE: 1959 (2nd Edition)
SUBJECT: Electromagnetic theory, Relativity (Physics)

AUTHOR: Cullwick, E. G. (Ernest Geoffrey), 1903-
TITLE: The fundamentals of electro-magnetism by E.G. Cullwick.
EDITION 3rd ed.
PUBL.: London, Cambridge U.P.,
DATE: 1966 (3rd Edition)
SUBJECT: Electromagnetism

AUTHOR: Cullwick, E. G. (Ernest Geoffrey), 1903-
TITLE: The fundamentals of electro-magnetism; a restatement for
engineering students and others of physical and theoretical
principles in accordance with modern scientific thought,
by E. Geoffrey Cullwick ... With an appendix and numerous
examples on the recently adopted M.K.S. system of practical
units ...
PUBL.: New York, The Macmillan company; Cambridge, Eng., The
University press,
DATE: 1939
SUBJECT: Electromagnetism

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