RUSSIAN ACADEMY OF SCIENCES
SIBERIAN BRANCH
INSTITUTE OF EARTH'S CRYOSPHERE

Joseph J.Smulsky

**The Electromagnetic and Gravitational Actions**
**(The Non-relativistic Tractates)**

Copy in a djvu-format the Russian edition of the book you can here:
http://www.ikz.ru/~smulski/ElGrVz.djvu and in pdf-format here
http://www.ikz.ru/~smulski/ElGrVz2.pdf

Edited by Prof. S.P.Gabuda

VO "Nauka"
Novosibirsk
1994

---

Smulsky J.J. The Electromagnetic and Gravitational Actions (the Non-relativistic tractates).- Novosibirsk: Science Publishers .-
-1994.-225 p. (In Russian language).

Referees: prof. Vladimir N.Kutrunov;
prof. Vitaliy F.Novikov.

Despite the fact that the Theory of Relativity (TR) has been in existence for almost 90 years, there is widespread criticism of this theory now from scientists all over the world. TR has become the basis of many current physics theories and it has had an influence on astronomy and astrophysics as well as other sciences and even on man's understanding of the world. With the advent of relativity, clear thinking was abolished. The idea that something which cannot be understood may nevertheless exist made its entry into society and man lost all belief in his ability to reason.

More than 25 years ago the author of this monograph has exposed the errors in the initial assumptions of TR and, removing these erroneous positions, created a new approach with the help of which all those problems that were considered on the basis of TR can be resolved. In this approach space, time and mass do not depend on motion; they are defined in accordance with our daily life experience. The influence of the finite velocity of propagation of interaction is taken into account through consideration of the force resulting from the relative velocity of interacting bodies. The book is devoted to analyzing the TR, laying the ground for a non-relativistic approach and its practical application. A new structure of the physical world is derived, proposing a truthful view of natural phenomena. The book allows us to regain confidence in our knowledge and our ability to reason clearly.

Despite a sufficient abundance of mathematical formulas and of detailed information (it contains methods of calculation for particle accelerators and tables of new fundamental trajectories), the book is written in a clear and understandable way and will be interesting for students and teachers. It will be useful as well for physicists, both scientists and students, and for all who have an interest in the fundamental problems of physics.

The methods of calculation can be used by designers of particle accelerators. The astrophysics can use the tables of new fundamental trajectories. Investigators in areas of nuclear Physics, Physics of elementary particles and cosmic ray Physics can use these tables too.

CONTENTS

Preface . . . . . 5
Notation . . . . . 8
Chapter 1. Unhypothetical approach in electrodynamics and theory of gravity . . . . . 10
1.1. Introduction . . . . . 10
1.2. The action and its description . . . . . 11
1.3. The electromagnetic action and its new description . 12
1.4. The analysis of TR . . . . . 14
1.5. The results of the new description . . . . . 15
1.6. The theory of gravity and General TR . . . . 17
1.7. Conclusion . . . . . 18
References . . . . . 19
Chapter 2. About some questions of physics . . . . . 20
2.1. About electrodynamics equations . . . . . 20
2.2. The Lorentz's transformations . . . . . 22
2.3. The ether and TR . . . . . 23
2.4. The transformations essence . . . . . 26
2.5. About transformation of the wave equation . . . 36
2.6. About propagation of light . . . . . 39
2.7. The principle of relativity and speed limit are two erroneous initial positions of the TR . . . . 41
2.9. Conclusion . . . . . 47
References . . . . . 50
Chapter 3. The motion equations taking into account the velocity of propagation of interaction . . . . . 50
3.1. D'Alamber equation for point charge . . . . 50
3.2. The solution of the D'Alamber equation . . . . 51
3.3. The law of two bodies' relative motion . . . . 59
3.4. The integration of the motion law . . . . . 60
3.5. Transition to classical and relativistic mechanics . 63
3.6. Conclusion . . . . . 66
References . . . . . 66
Chapter 4. About electrical forces or non-relativistic description of the actions on the quickly moving charged bodies . . 67
4.1. Introduction . . . . . 67
4.2. The force, mass, acceleration and dependence between them as the method of the action expression . . . 70
4.3. Interaction of the motionless charged bodies . . . 76
4.4. Description of action from moving charged bodies . . 78
4.5. The change of action force created by moving charged body . . . . . 80
4.6. The definition of the action force created by moving charged body . . . . . 83
4.7. The action force of one charged particle on other . . 85

4.8. The motion of the charged point bodies . . . . 87
4.9. The action of the charged right-angled plate on the charged particle . . . . . 88
4.10. The action of the charged straight line on the charged particle . . . . . 91
4.11. The action of the charged body on the magnet . . . 94
4.12. The action of the magnet on the charged particle . . 94
4.13. The action of a piece of conductor with current on charged particle . . . . . 95
4.14. The action of the straight conductor with current on charged particle . . . . . 95
4.15. The action of circular conductor with current on charged particle . . . . . 97
4.16. Conclusion . . . . . 98
References . . . . . 99
Chapter 5. The production of superluminal particle . . . 109
5.1. Introduction . . . . . 109
5.2. Interaction of the motionless charged bodies; meaning of the force and acceleration notations . 110
5.3. Contradiction of the contemporary description . 112
5.4. The new description based on the facts . . . 113
5.5. The calculation of the particles motion in accelerators with assistance of the new approach . . . 116
5.6. The achievement of superluminal velocity. . . 120
5.7. The multistage accelerators of superluminal particles . . . . . 123
5.8. Appendix.The production of superluminal particles. Yes or no. (Author's correspondence with state referees) . 124
References . . . . . 147
Chapter 6. Bucherer's experiment confirming the new approach . 148
6.1. Introduction . . . . . 148
6.2. The essence of the experiment and all problem . 149
6.3. The description of experimental results by the new approach . . . . . 151
6.4. Conclusion . . . . . 152
6.5. Appendix 1. The right for publication . . . 153
6.6. Appendix 2. About essence of energy . . . 156
6.7. Appendix 3. When the brakes remove . . . 157
References . . . . . 162
Chapter 7. The new fundamental trajectories . . . . 162
7.1. The interaction depending on velocity . . . 162
7.2. The limit cases of interaction . . . . 164
7.3. The hyperboliclike trajectories . . . . 165
7.4. The paraboliclike and ellipselike trajectories . 170
7.5. The trajectories of repulsion . . . . 174
7.6. Conclusion . . . . . 174
7.7. Appendix. The asymptotic solution . . . . 175
References . . . . . 177
Afterword . . . . . 178
Appendix. The trajectories and their parameters . . . 185

PREFACE (See p.5)

The late 80th and early 90th of this century were marked with a stormy development of researches aimed at criticism of the Theory of Relativity, both General and Special. Some practical scientists have been opposed to it for decades, which has been expressed and gradually accumulated in unpublished scientific works. Political reforms launched in the USSR triggered publication of these works in periodicals, presentation at conferences in this country and abroad.

Variety of issues covered by the Theory of Relativity often overshadows the major point for which the Theory was created, i.e. description of interaction between the bodies, which velocities are comparable with the velocity of light. In the present work this issue is given prior attention. Having analyzed the Theory and preceding works, the author has revealed the causes of contradictions in the Theory of Relativity and come to the conclusion that electrical and gravitational interactions can be considered in terms of non-relativistic notions about space, mass and time. The method suggested operates on pre-relativistic notions similar to those we encounter in everyday life, techniques, and in those sciences where mass, space and time are considered independent of motion.

The book is compiled of separate works written in different periods. The majority of works were written between 1968 and 1973. Every work was designed in an independent mode. In chapter 1 a summary is presented that was written in 1990. It contains a systematized method and the logic of its elaboration, as well as some essential results. In chapters 2-6 the ideas presented in chapter 1 are justified. In chapter 2 the Theory of Relativity is analyzed. The essence of Lorentz's transformations is revealed. It is shown that the principle of relativity and ultimate velocity are two wrong premises in the Theory of Relativity.

Chapter 3 contains the expression for the interaction force of two point charges, derived from the electrodynamics equation. Force does not only depend on the distance between the charges, but on their relative velocity. The latter is determined by the fact that electromagnetic action propagates at the finite velocity. Relative motion of the charged particles is considered. It is known that in the General Theory of Relativity the ultimate velocity of the gravitation action is assumed to be equivalent to the velocity of light. It is shown that the results derived from this assumption produce the same effects as in the General Theory of Relativity. That means that relativistic effects are determined by the finite gravitation velocity, not by the time-space curvature. The effects occur if gravitation velocity is equal to the velocity of light.

Chapter 4 is devoted to a detailed analysis of interaction between electrified and magnetized moving bodies. Considered are the principles for description of interaction between two motionless charged bodies in terms of mass and force. It is shown that their interconnection expressed by the second law of mechanics does not depend upon the form of interaction, provided their definitions are correct. It is also shown that the action evoked by a moving charged body is expressed through force, which depends upon the velocity of the body. Considered are the action forces of a charged point body, a plate, and conductors with current on a charged moving particle.

In chapter 5 logical justification and further development are presented of a new approach to description of superfast bodies' interaction. Particles motion in accelerators is considered, and the way to calculate them is shown. A method is suggested for particle acceleration up to superluminal velocities, and relevant calculations are carried out. It is shown that technical potentials allow producing particles with the velocity exceeding the velocity of light by 1.3. Multistage accelerators can exceed even this velocity. In appendix to this chapter issues related to production of superluminal particles are considered.

In chapter 6 Bucherer's experiment dated back to 1909 is considered. According to K.N. Shaposhnikov and N. Kasterin, the experiment contradicts the Theory of Relativity. It is shown that

a new approach describes the results of the experiment. In appendix to this chapter a relationship is derived for substance energy $E = mc^2$ on the basis of the classical mechanics.

In chapter 7 trajectories are derived from numerical calculation of equations for motion of one body relative to another with interaction propagating at the velocity of light. Trajectories, unlike classical ones, are two-parameters. The whole range of trajectories is investigated under varying parameters. It is shown that with a velocity increase the angle between asymptotes of hyperbolic trajectories diminishes and can even become negative. At a large parameter of interaction the velocity in the pericentre achieves the velocity of light. Considered are also parabolic and ellipsoidal trajectories, which differ from classical on the pericentre turn. The period of the limit trajectories can be less or more than 2p. Considered are the trajectories of capture of one radius on another from the orbit and with the velocity of light in the pericentre. The impact of the relative velocity on hyperbolic trajectories at repel interaction is shown. As a result of asymptotic solutions analytical boundaries were determined between different sets of trajectories. It is shown that in the limit cases trajectories transfer to classical and relativistic. It was determined that the relativistic interaction is weaker compared with classical, so "black holes" can exist at gravitation interaction, the velocity of which exceeds greatly the velocity of light.

In Appendix there are parameters and tables of 92 trajectories of bodies' motion with interaction force which depend on velocity. Here for comparison, the parameters of classical trajectories are presented. For comfortable using the trajectories are systematized and are given to numbers.

I should like to thank professors S.P. Gabuda, V.N. Kutrunov, and V.F. Novikov for benevolent considering my book. I thank Chief of "NESSI" firm Yu.S. Haziainov, and N.L. Rusakov for financial support of publishing my book.

I should to guilty to my wife, sons and the late mother that all my strength and thoughts were setting in this labor and I should to thank them for infinite patience.

I hearty thank to Vladimir P. Melnikov, Director of the Institute, for favorable care to my work, without which I would not issue this book.

Should you have any remarks, please, do not hesitate to contact:

Pr. Joseph J. Smulsky,
Institute of the Earth's Cryosphere,
Siberian Branch Russian Academy of Sciences,
Malygina Str. 86, 625026, Tyumen, Russia.