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THE PROGRAM
FOR CALCULATING PARAMETERS OF MICROPARTICLES
ON THE BASIS OF THE FUNDAMENTAL FIELD THEORY BY I.L. GERLOVIN

The aim of the present publication is to present the developed program and the results of computation parameters of microparticles using this program on a personal computer according to the formulas of the Fundamental Field Theory developed by the talented Soviet theoretical physicist I. L. Gerlovin in the 1960-1980 years.

The program for calculating the microparticles parameters was developed by using the formulas of the Periodic Law Microparticles (PLM), which is an integral part of the Fundamental Field Theory (FFT) developed by I. L. Gerlovin. When compiling the program by the formulas published in the FFT literature [1-6], was used the software package MATLAB - an interactive system for performing scientific and engineering calculations with arrays of data on personal computers. The present publication is the set of m.files (with comments) of the program package MATLAB for a machine calculation of the parameters the 1, 2 , 3 series of PLM of the main states (1-4) by the formulas [5, table 16.1] with the correction of misprints and errors by comparison with published earlier [2 - 4]. The designations used in the developed m.files are summarized in the accompanying table. For the calculated parameters of the optimum (OP) particles (proton and electron) used in the calculations the corresponding indices "p, e" are applied. The files are published in the text editor PDF. There are tables (PDF) for the 1,2,3 series PLM of the results of calculations of internal parameters of microparticles and, as an example, of external parameters of the chosen for each series by 1-2 microparticles for the purpose of their comparison with the results published by I.L. Gerlovin [5,6].

For own performance of calculations on the presented set of files they should be converted in m.files and versions of programs MATLAB since 6-6.1 and above are used. However, the latest versions of MATLAB programs R2021a, R2021b, designed for 64-bit operating systems Windows-7, Windows-10 seem to be the most effective for time calculations and graphical interpretation of results.

Literature

1. Gerlovin I.L. Systematization of elementary particles and considerations on bases of future theory. Preprint ITP of AS UkrSSR № 69-53. - Kiev, 1969.
2. Gerlovin I.L. Fundamentals of a Unified Relativistic Quantum Theory of a Fundamental Field. – GAO AS USSR, dep. of VINITI, № 7084 -73.
3. Protodiakonov M.M. and Gerlovin I.L. Electron Structure and Physical Properties of Crystals. – M., Nauka, 1975.
4. Catalog of Parameters of Predicted and Known Elementary Particles (Periodic Law Microparticles (PLM)), 2-nd edition. – USSR NAVY, publishing by VVMIOLU named F.E. Dzerzhinsky, 1977.
5. Gerlovin I.L. Fundamentals of the Unified Theory of All Interactions in Matter. – L., Energoatomizdat, 1990.
6. Gerlovin I.L. To live without disasters. – St. Petersburg, 1992.

TABLE OF CONCORDANCE OF USED DESIGNATIONS

PARAMETER DESIGNATION	Unit Ed.	NOTATION IN BOOKS FFT	NOTATION WHEN PROGRAMMING IN MATLAB
Fundamental constants to calculate		K, Kp, K1, K1p, A,	K, Kp, K1, K1p, A,
Designation of optimal particle in the series		Nop, Ndop	Nop, Ndop
Designation of states		Δ (main 1, 2, 3, 4), 32 multiplets all	main: 1 - no index, 2 - a, 3 - d, 4 - da
Notation of particles and antiparticles in the states		particle - P , antiparticle - A	P - without a notation, antiparticle - A
Mean value of total number of subparticles in the series		n	n
Limiting search function (n)		F(n)	F(n)
Number of subparticles on outer and inner circles of microparticle model		n1, n2	n1, n2
Linear velocities of subparticles relative to the speed of light		β1, β2, βL, Δ β	b1, b2, bL, db,
Radiuses of the outer (Schwarzschild sphere) and inner circles of the microparticle model structure	cm	R1, R2	R1, R2
Auxiliary design parameters		kx, ky, Q1, tv, tvd, dR=R2/R1	C1=1-b1^2, C2=1-b2^2, kx, ky, Q1, t, td, dR
Auxiliary coefficients		A1, A2, Am	A1, A2, Am
Background dielectric permittivity of vacuum		$e_ф$	ef
"Background coefficient" of vacuum		$κ_ф$	kf
Vacuum dielectric permittivity		e1, e2, e1d, e2d	e1, e2, e1d, e2d

PARAMETER DESIGNATION	Unit Ed.	NOTATION IN BOOKS FFT	NOTATION WHEN PROGRAMMING IN MATLAB
External fundamental charge	$(hi*c)^{1/2}$	q1,q1n, q1d, q1dn	q1,q1n, q1d, q1dn
Observed electric charge	$qe=(\alpha*hi*c)^{1/2}$	q, qd, qn, qdn	q, qd, qn, qdn
Mass	me	m, mn, md, mdn	m, mn, md, mdn
Total mechanical moment	hi	s, sd	s, sd
Spin (projection (s, sd) on the precession axis)	hi	J, Jd	J, Jd
Cosines of the angles of the procession moment		cos(α)	cos(angl)
Magnetic moment		μ1, μ1n, μ1d, μ1dn,	Mu, Mun, Mud, Mudn
Effective values of the charge, mass, spin, magnetic moment		$q_{эф}$, $m_{эф}$, $J_{эф}$, $\mu_{эф}$,	qf, mf, Jf, Muf
Planck's constant	h, ħ	h, ħ=h/2/pi	h, hi=h/2/pi
Velocity of light	c	c	c
Proton mass	me	m_p	mp
Electron mass	me	m_e	me
Fine structure constant		α, α_e, α_{inv}	AL, ALe, ALi
Classical lifetime	sec	$\tau_{кл}$	tcl, tcla, tcld, tclda
Quantum lifetime	sec	$\tau_{кв}$	tcv, tcva, tcvd, tcvda
Resonance line width (h/eV/ τ)	MeV	Γ	G

Note: When performing the machine calculation of microparticle parameters in FFT publications [4-6] a value of π =3.14159226535 8979323846264338327950288 in 36 significant digits was used. In the developed program the value π =3.14159226535 8979 in 16 significant digits was used.