6 RECOMMENDED VALUES OF THE FUNDAMENTAL PHYSICAL CONSTANTS

This report is primarily concerned with establishing recognized standards of usage for symbols, units and nomenclature in physics, thus improving comprehension and understanding. However, communication is simplified not only if there are standards for symbols, but also if there is a uniformity of usage of the numerical values of the basic physical quantities that enter into data analysis in all branches of science and technology. To this end, the Committee on Data for Science and Technology (CODATA), through its Task Group on Fundamental Constants, has recommended a set of values of the physical constants for general use. These numerical values have the advantage that they are consistent in the sense that they properly reflect all known physical interrelationships among the constants and take into account the constraints imposed by the results of all evaluated experimental measurements and theoretical calculations.

The tables in this section are drawn from the Task Group report*, and are based on a least-squares adjustment with 17 degrees of freedom. The digits in parentheses following the numerical values are the one-standard-deviation uncertainty in the last digits of the given value.

Table 9 gives a listing of CODATA recommended values of important physical and chemical constants; table 10 gives the values of some conversion constants and standards which, although they cannot be considered to be 'fundamental' constants, are nonetheless important in pure and applied physics.

Since the uncertainties of many of these entries are correlated, the full variance matrix must be used in evaluating the uncertainties of quantities computed from them. An expanded variance matrix for the variables of tables 9 and 10 is given in table 11. To use this table note that the covariance between two quantities Q_k and Q_s which are functions of a common set of variables x_i $(i = 1, \ldots, N)$ is given by

$$v_{ks} = \sum_{i,j=1}^{N} \frac{\partial Q_k}{\partial x_i} \frac{\partial Q_s}{\partial x_j} v_{ij}, \tag{1}$$

where v_{ij} is the covariance of x_i and x_j. In this general form, the units of v_{ij} are the product of the units of x_i and x_j and the units of v_{ks} are the product of the units of Q_k and Q_s. For most cases of interest involving the fundamental constants, the variables x_i may be taken to be the fractional change in the physical quantity from some fiducial value, and the quantities Q can be expressed as powers of physical constants Z_j according to

$$Q_k = q_k \prod_{j=1}^{N} Z_j^{Y_{kj}}, \tag{2}$$

where q_k is a auxiliary constant or a numerical factor. If the variances and covariances are then expressed in relative units, eq. (1) becomes

$$v_{ks} = \sum_{i,j=1}^{N} Y_{ki} Y_{sj} v_{ij}. \tag{3}$$

Equation (3) is the basis for the expansion of the variance matrix to include e, h, m_e, N_A, and F.

In terms of correlation coefficients defined by $r_{ij} = v_{ij}(v_{ii}v_{jj})^{-\frac{1}{2}} = v_{ij}/\epsilon_i\epsilon_j$, where ϵ_i is the standard deviation ($\epsilon_i^2 = v_{ii}$) we may write, from eq. (3),

$$\epsilon_k^2 = \sum_{i=1}^{N} Y_{ki}^2 \epsilon_i^2 + 2 \sum_{j<i}^{N} Y_{ki} Y_{kj} r_{ij} \epsilon_i \epsilon_j. \tag{4}$$

* *The 1986 Adjustment of the Fundamental Physical Constants*, E. Richard Cohen and Barry N. Taylor, CODATA Bulletin Number 63 (Pergamon Press, Elmsford, NY 10523, USA, and Headinghill Hall, Oxford OX3 0BW, UK, November, 1986). CODATA is a Committee of the International Council of Scientific Unions, 51 Blvd de Montmorency, 75016 Paris, France.

Table 9. 1986 recommended values of the fundamental physical constants.

The digits in parentheses are the one-standard-deviation uncertainty in the last digits of the given value. Since the uncertainties of many of these entries are correlated, the full variance matrix must be used in evaluating the uncertainties of quantities computed from them.

GENERAL CONSTANTS

Universal constants

Quantity	Symbol	Value	Relative uncertainty, parts in 10^6
speed of light in vacuum; *vitesse de la lumière dans le vide*	c	$299\,792\,458$ m s^{-1}	(exact)
permeability of vacuum; *perméabilité du vide*	μ_o	$4\pi\times10^{-7}$ N A^{-2} =12.566 370 614 ... $\times10^{-7}$ N A^{-2}	(exact)
permittivity of vacuum; *permittivité du vide* : $1/\mu_o c^2$	ϵ_o	8.854 187 817 ... $\times10^{-12}$ F m^{-1}	(exact)
gravitational constant; *constante de gravitation*	G	6.672 59(85)$\times10^{-11}$ m^3 kg^{-1} s^{-2}	128
Planck constant; *constante de Planck*	h	6.626 0755(40)$\times10^{-34}$ J s	0.60
		4.135 6692(12)$\times10^{-15}$ eV s	0.30
$h/2\pi$	$\hbar$	1.054 572 66(63)$\times10^{-34}$ J s	0.60
		6.582 1220(20)$\times10^{-16}$ eV s	0.30
Planck mass; *masse de Planck* : $(\hbar c/G)^{\frac{1}{2}}$	m_P	2.176 71(14)$\times10^{-8}$ kg	64
Planck length; *longueur de Planck* : $\hbar/m_P c = (\hbar G/c^3)^{\frac{1}{2}}$	l_P	1.616 05(10)$\times10^{-35}$ m	64
Planck time; *temps de Planck* : $l_P/c = (\hbar G/c^5)^{\frac{1}{2}}$	t_P	5.390 56(34)$\times10^{-44}$ s	64

Electromagnetic constants

Quantity	Symbol	Value	Relative uncertainty, parts in 10^6
elementary charge; *charge élémentaire*	e	1.602 177 33(49)$\times10^{-19}$ C	0.30
	e/h	2.417 988 36(72)$\times10^{14}$ A J^{-1}	0.30
magnetic flux quantum; *quantum de flux magnétique* : $h/2e$	Φ_o	2.067 834 61(61)$\times10^{-15}$ Wb	0.30
Josephson frequency–voltage quotient; *quotient fréquence-tension dans l'effet Josephson*	$2e/h$	4.835 9767(14)$\times10^{14}$ Hz V^{-1}	0.30
quantized Hall conductance; *conductance quantifiée de Hall*	e^2/h	3.874 046 14(17)$\times10^{-5}$ S	0.045
quantized Hall resistance; *résistance quantifiée de Hall* : $h/e^2 = \mu_o c/2\alpha$	R_H	25 812.8056(12) Ω	0.045
Bohr magneton; *magnéton de Bohr* : $e\hbar/2m_e$	μ_B	9.274 0154(31)$\times10^{-24}$ J T^{-1}	0.34
		5.788 382 63(52)$\times10^{-5}$ eV T^{-1}	0.089
	μ_B/h	1.399 624 18(42)$\times10^{10}$ Hz T^{-1}	0.30
	μ_B/hc	46.686 437(14) m^{-1} T^{-1}	0.30
	μ_B/k	0.671 7099(57) K T^{-1}	8.5

Quantity	Symbol	Value	Relative uncertainty, parts in 10^6
nuclear magneton; *magnéton nucléaire* : $e\hbar/2m_p$	μ_N	5.050 7866(17)$\times10^{-27}$ J T^{-1}	0.34
		3.152 451 66(28)$\times10^{-8}$ eV T^{-1}	0.089
	μ_N/h	7.622 5914(23) MHz T^{-1}	0.30
	μ_N/hc	2.542 622 81(77)$\times10^{-2}$ m^{-1} T^{-1}	0.30
	μ_N/k	3.658 246(31)$\times10^{-4}$ K T^{-1}	8.5

ATOMIC CONSTANTS

Quantity	Symbol	Value	Relative uncertainty, parts in 10^6
fine-structure constant; *constante de structure fine* : $\mu_o ce^2/2h$	α	0.007 297 353 08(33)	0.045
	α^{-1}	137.035 9895(61)	0.045
	α^2	5.325 136 20(48)$\times10^{-5}$	0.090
Rydberg constant; *constante de Rydberg* : $m_e c\alpha^2/2h$	R_∞	10 973 731.534(13) m^{-1}	0.0012
	$R_\infty c$	3.289 841 9499(39)$\times10^{15}$ Hz	0.0012
	$R_\infty hc$	2.179 8741(13)$\times10^{-18}$ J	0.60
		13.605 6981(40) eV	0.30
Bohr radius; *rayon de Bohr* : $\alpha/4\pi R_\infty$	a_o	0.529 177 249(24)$\times10^{-10}$ m	0.045
quantum of circulation; *quantum de circulation*	$h/2m_e$	3.636 948 07(33)$\times10^{-4}$ m^2 s^{-1}	0.089
	h/m_e	7.273 896 14(65)$\times10^{-4}$ m^2 s^{-1}	0.089

Electron

Quantity	Symbol	Value	Relative uncertainty, parts in 10^6
electron mass; *masse de l'électron*	m_e	9.109 3897(54)$\times10^{-31}$ kg	0.59
		5.485 799 03(13)$\times10^{-4}$ u	0.023
		0.510 999 06(15) MeV	0.30
electron–muon mass ratio; *rapport de la masse du muon à celle de l'électron*	m_e/m_μ	0.004 836 332 18(71)	0.15
electron–proton mass ratio; *rapport de la masse de l'électron à celle du proton*	m_e/m_p	5.446 170 13(11)$\times10^{-4}$	0.020
electron–deuteron mass ratio; *rapport de la masse du deuteron à celle de l'électron*	m_e/m_d	2.724 437 07(6)$\times10^{-4}$	0.020
electron–α-particle mass ratio; *rapport de la masse de la particule α à celle de l'électron*	m_e/m_α	1.370 933 54(3)$\times10^{-4}$	0.021
electron specific charge; *charge massique de l'électron*	$-e/m_e$	$-1.758\,819\,62(53)\times10^{11}$ C kg^{-1}	0.30
electron molar mass; *masse molaire de l'électron*	$M(e), M_e$	5.485 799 03(13)$\times10^{-7}$ kg/mol	0.023
Compton wavelength; *longueur d'onde de Compton* : $h/m_e c$	λ_C	2.426 310 58(22)$\times10^{-12}$ m	0.089
$\lambda_C/2\pi = \alpha a_o = \alpha^2/4\pi R_\infty$	$\bar{\lambda}_C$	3.861 593 23(35)$\times10^{-13}$ m	0.089
classical electron radius; *rayon classique de l'électron* : $\alpha^2 a_o$	r_e	2.817 940 92(38)$\times10^{-15}$ m	0.13
Thomson cross section; *section efficace de Thomson* : $(8\pi/3)r_e^2$	σ_e	0.665 246 16(18)$\times10^{-28}$ m^2	0.27

electron magnetic moment; *moment magnétique de l'électron*	μ_e	$9.284\,7701(31)\times10^{-24}\,\mathrm{J\,T^{-1}}$	0.34
	μ_e/μ_B	$1.001\,159\,652\,193(10)$	1×10^{-5}
	μ_e/μ_N	$1838.282\,000(37)$	0.020
electron–muon magnetic moment ratio; *rapport du moment magnétique de l'électron à celui du muon*	μ_e/μ_μ	$206.766967(30)$	0.15
electron–proton magnetic moment ratio; *rapport du moment magnétique de l'électron à celui du proton*	μ_e/μ_p	$658.210\,6881(66)$	0.010
Muon			
muon mass; *masse du muon*	m_μ	$1.883\,5327(11)\times10^{-28}\,\mathrm{kg}$	0.61
		$0.113\,428\,913(17)\,\mathrm{u}$	0.15
		$105.658\,389(34)\,\mathrm{MeV}$	0.32
muon–electron mass ratio; *rapport de la masse du muon à celle de l'électron*	m_μ/m_e	$206.768\,262(30)$	0.15
muon molar mass; *masse molaire du muon*	$M(\mu), M_\mu$	$1.134\,289\,13(17)\times10^{-4}\,\mathrm{kg/mol}$	0.15
muon magnetic moment; *moment magnétique du muon*	μ_μ	$4.490\,4514(15)\times10^{-26}\,\mathrm{J\,T^{-1}}$	0.33
	μ_μ/μ_B	$0.004\,841\,970\,97(71)$	0.15
	μ_μ/μ_N	$8.890\,5981(13)$	0.15
muon magnetic moment anomaly; *anomalie du moment magnétique du muon* : $[\mu_\mu/(e\hbar/2m_\mu)]-1$	a_μ	$0.001\,165\,9230(84)$	7.2
muon–proton magnetic moment ratio; *rapport du moment magnétique du muon à celui du proton*	μ_μ/μ_p	$3.183\,345\,47(47)$	0.15
Proton			
proton mass; *masse du proton*	m_p	$1.672\,6231(10)\times10^{-27}\,\mathrm{kg}$	0.59
		$1.007\,276\,470(12)\,\mathrm{u}$	0.012
		$938.272\,31(28)\,\mathrm{MeV}$	0.30
proton–electron mass ratio; *rapport de la masse du proton à celle de de l'électron*	m_p/m_e	$1836.152\,701(37)$	0.020
proton–muon mass ratio; *rapport de la masse du proton à celle du muon*	m_p/m_μ	$8.880\,2444(13)$	0.15
proton specific charge; *charge massique du proton*	e/m_p	$9.578\,8309(29)\times10^{7}\,\mathrm{C\,kg^{-1}}$	0.30
proton molar mass; *masse molaire du proton*	$M(p), M_p$	$1.007\,276\,470(12)\times10^{-3}\,\mathrm{kg/mol}$	0.012
proton Compton wavelength; *longueur d'onde de Compton du proton* : h/m_pc	$\lambda_{C,p}$	$1.321\,410\,02(12)\times10^{-15}\,\mathrm{m}$	0.089
$\lambda_{C,p}/2\pi$	$\bar{\lambda}_{C,p}$	$2.103\,089\,37(19)\times10^{-16}\,\mathrm{m}$	0.089

proton magnetic moment; *moment magnétique du proton*	μ_p	$1.410\,607\,61(47)\times10^{-26}\,\mathrm{J\,T^{-1}}$	0.34
	μ_p/μ_B	$0.001\,521\,032\,202(15)$	0.010
	μ_p/μ_N	$2.792\,847\,386(63)$	0.023
diamagnetic shielding correction; *facteur d'écran diamagnétique* (H_2O, sph., 25 °C): $1-\mu_p'/\mu_p$	σ_{H_2O}	$25.689(15)\times10^{-6}$	–
shielded proton moment; *moment magnétique du proton non corrigé* (H_2O, sph., 25 °C)	μ_p'	$1.410\,571\,38(47)\times10^{-26}\,\mathrm{J\,T^{-1}}$	0.34
	μ_p'/μ_B	$0.001\,520\,993\,129(17)$	0.011
	μ_p'/μ_N	$2.792\,775\,642(64)$	0.023
proton gyromagnetic ratio; *coefficient gyromagnétique du proton*	γ_p	$26\,752.2128(81)\times10^{4}\,\mathrm{s^{-1}\,T^{-1}}$	0.30
	$\gamma_p/2\pi$	$42.577\,469(13)\,\mathrm{MHz\,T^{-1}}$	0.30
uncorrected; *non corrigé* (H_2O, sph., 25 °C)	γ_p'	$26\,751.5255(81)\times10^{4}\,\mathrm{s^{-1}\,T^{-1}}$	0.30
	$\gamma_p'/2\pi$	$42.576\,375(13)\,\mathrm{MHz\,T^{-1}}$	0.30
Neutron			
neutron mass; *masse du neutron*	m_n	$1.674\,9286(10)\times10^{-27}\,\mathrm{kg}$	0.59
		$1.008\,664\,904(14)\,\mathrm{u}$	0.014
		$939.565\,63(28)\,\mathrm{Mev}$	0.30
neutron–electron mass ratio; *rapport de la masse du neutron à celle de l'électron*	m_n/m_e	$1838.683\,662(40)$	0.022
neutron–proton mass ratio; *rapport de la masse du neutron à celle du proton*	m_n/m_p	$1.001\,378\,404(9)$	0.009
neutron molar mass; *masse molaire du neutron*	$M(n), M_n$	$1.008\,664\,904(14)\times10^{-3}\,\mathrm{kg/mol}$	0.014
neutron Compton wavelength; *longueur d'onde de Compton du neutron* : h/m_nc	$\lambda_{C,n}$	$1.319\,591\,10(12)\times10^{-15}\,\mathrm{m}$	0.089
$\lambda_{C,n}/2\pi$	$\bar{\lambda}_{C,n}$	$2.100\,194\,45(19)\times10^{-16}\,\mathrm{m}$	0.089
neutron magnetic moment; *moment magnétique du neutron*	μ_n	$0.966\,237\,07(40)\times10^{-26}\,\mathrm{J\,T^{-1}}$	0.41
	μ_n/μ_B	$0.001\,041\,875\,63(25)$	0.24
	μ_n/μ_N	$1.913\,042\,75(45)$	0.24
neutron–electron magnetic moment ratio; *rapport du moment magnétique du neutron à celui de l'électron*	μ_n/μ_e	$0.001\,040\,668\,82(25)$	0.24
neutron–proton magnetic moment ratio; *rapport du moment magnétique du neutron à celui du proton*	μ_n/μ_p	$0.684\,979\,34(16)$	0.24
Deuteron			
deuteron mass; *masse du deutéron*	m_d	$3.343\,5860(20)\times10^{-27}\,\mathrm{kg}$	0.59
		$2.013\,553\,214(24)\,\mathrm{u}$	0.012
		$1875.613\,39(57)\,\mathrm{MeV}$	0.30

Quantity	Symbol	Value	Relative uncertainty (ppm)
deuteron–electron mass ratio; *rapport de la masse du deutéron à celle de l'électron*	m_d/m_e	3670.483 014(75)	0.020
deuteron–proton mass ratio; *rapport de la masse du deutéron à celle du proton*	m_d/m_p	1.999 007 496(6)	0.003
deuteron molar mass; *masse molaire du deutéron*	$M(d)$, M_d	$2.013\,553\,214(24)\times10^{-3}$ kg/mol	0.012
deuteron magnetic moment; *moment magnétique du deutéron*	μ_d	$0.433\,073\,75(15)\times10^{-26}$ J T^{-1}	0.34
	μ_d/μ_B	$0.466\,975\,4479(91)\times10^{-3}$	0.019
	μ_d/μ_N	0.857 438 230(24)	0.028
deuteron–electron magnetic moment ratio; *rapport du moment magnétique du deutéron à celui de l'électron*	μ_d/μ_e	$4.664\,345\,460(91)\times10^{-4}$	0.019
deuteron–proton magnetic moment ratio; *rapport du moment magnétique du deutéron à celui du proton*	μ_d/μ_p	0.307 012 2035(51)	0.017

PHYSICO-CHEMICAL CONSTANTS

Quantity	Symbol	Value	Relative uncertainty (ppm)
Avogadro constant; *constante d'Avogadro*	N_A, L	$6.022\,1367(36)\times10^{23}$ mol^{-1}	0.59
atomic mass constant; *constante de masse atomique* : $\frac{1}{12}m(^{12}C)$	m_u	$1.660\,5402(10)\times10^{-27}$ kg	0.59
		931.494 32(28) MeV	0.30
Faraday constant; *constante de Faraday*	F	96 485.309(29) C mol^{-1}	0.30
molar Planck constant; *constante molaire de Planck*	$N_A h$	$3.990\,313\,23(36)\times10^{-10}$ J s mol^{-1}	0.089
	$N_A hc$	0.119 626 58(11) J m mol^{-1}	0.089
molar gas constant; *constante molaire de gaz*	R	8.314 510(70) J mol^{-1} K^{-1}	8.4
Boltzmann constant; *constante de Boltzmann* : R/N_A	k	$1.380\,658(12)\times10^{-23}$ J K^{-1}	8.5
		$8.617\,385(73)\times10^{-5}$ eV K^{-1}	8.4
	k/h	$2.083\,674(18)\times10^{10}$ Hz K^{-1}	8.4
	k/hc	69.503 87(59) m^{-1} K^{-1}	8.4
molar volume (ideal gas); *volume molaire (gaz parfait)* : RT/p, $T = 273.15$ K, $p = 101\,325$ Pa	V_m	22 414.10(19) cm mol^{-1}	8.4
Loschmidt constant; *constante de Loschmidt* : N_A/V_m	n_o	$2.686\,763(23)\times10^{25}$ m^{-3}	8.5
Sackur–Tetrode (absolute entropy) constant; *constante de Sackur–Tetrode (entropie absolue)* : * $\frac{5}{2} + \ln\{(2\pi m_u kT_1/h^2)^{\frac{3}{2}} kT_1/p_o\}$, $T_1 = 1$ K, $p_o = 100$ kPa	S_o/R	−1.151 693(21)	18
$p_o = 101\,325$ Pa		−1.164 856(21)	18

RADIATION CONSTANTS

Quantity	Symbol	Value	Relative uncertainty (ppm)
Stefan–Boltzmann constant; *constante de Stefan–Boltzmann* : $(\pi^2/60)k^4/\hbar^3c^2$	σ	$5.670\,51(19)\times10^{-8}$ W m^{-2} K^{-4}	34
first radiation constant; *première constante de rayonnement* : $2\pi hc^2$	c_1	$3.741\,7749(22)\times10^{-16}$ W m^2	0.60
second radiation constant; *deuxième constante de rayonnement* : hc/k	c_2	0.014 387 69(12) m K	8.4
Wien displacement law constant; *constante de la loi du déplacement de Wien* : $\lambda_{max}T = c_2/4.965\,114\,23\ldots$	b	0.002 897 756(24) m K	8.4

* The molar entropy of an ideal monatomic gas of relative atomic weight A_r is given by
$$S = S_o + \tfrac{3}{2}R\ln A_r - R\ln(p/p_o) + \tfrac{5}{2}R\ln(T/K).$$

Table 10. Maintained units and standard values.

Quantity	Symbol	Value	Relative uncertainty, parts in 10^6
electron volt: $(e/\mathrm{C})\,\mathrm{J} = \{e\}\,\mathrm{J}$	eV	$1.602\,177\,33(49)\times10^{-19}$ J	0.30
		$11\,604.45(10)$ K	8.5
		$1.073\,543\,85(33)\times10^{-9}$ u	0.30
(unified) atomic mass unit: $1\,\mathrm{u} = m_u = \frac{1}{12}m(^{12}\mathrm{C})$	u	$1.660\,5402(10)\times10^{-27}$ kg	0.59
		$931.494\,32(28)$ MeV	0.30
standard atmosphere	atm	101 325 Pa	(exact)
standard acceleration of gravity	g_n	$9.806\,65\ \mathrm{m\,s^{-2}}$	(exact)
'As-maintained' electrical units			
BIPM maintained ohm, Ω_{69-BI}:			
$\Omega_{BI85} \equiv \Omega_{69-BI}$(1985 Jan 1)	Ω_{BI85}	$0.999\,998\,437(50)\ \Omega$	0.050
Drift rate: $d\Omega_{69-BI}/dt$		$-0.0566(15)\ \mu\Omega/\mathrm{a}$	—
BIPM maintained volt:			
$2e/h \equiv 483\,594.0\ \mathrm{GHz}/V_{76-BI}$		$0.999\,992\,41(30)$ V	0.30
BIPM maintained ampere:			
$A_{BIPM} = V_{76-BI}/\Omega_{69-BI}$	A_{BI85}	$0.999\,993\,97(30)$ A	0.30
X-ray standards			
x-unit: $\lambda(\mathrm{Cu\,K}\alpha_1)/1537.400$	xu(Cu)	$1.002\,077\,89(70)\times10^{-13}$ m	0.70
x-unit: $\lambda(\mathrm{Mo\,K}\alpha_1)/707.831$	xu(Mo)	$1.002\,099\,38(45)\times10^{-13}$ m	0.45
Å*: $\lambda(\mathrm{W\,K}\alpha_1)/0.209\,100$	Å*	$1.000\,014\,81(92)\times10^{-10}$ m	0.92

Table 11. Expanded matrix of variances, covariances and correlation coefficients for the 1986 recommended set of fundamental physical constants.

The elements of the variance matrix appear on and above the major diagonal in (parts in $10^8)^2$; correlation coefficients appear in *italics* below the diagonal. The variances and covariances given here have been rounded from those given in CODATA Bulletin No. 63.

The correlation coefficient between m_e and N_A appears as *−1.000* in this table because the auxiliary constants were considered to be exact in carrying out the least-squares adjustment. When the uncertainties of m_p/m_e and M_p are properly taken into account, the correlation coefficient is *−0.999* and the variances of m_e and N_A are slightly increased.

	α^{-1}	e	h	m_e	N_A	F	μ_μ/μ_p
α^{-1}	20	−31	−41	−1	1	−29	33
e	*−0.226*	921	1812	1750	−1750	−829	−50
h	*−0.154*	*0.997*	3582	3500	−3500	−1688	−67
m_e	*−0.005*	*0.975*	*0.989*	3497	−3497	−1747	−2
N_A	*0.005*	*−0.975*	*−0.989*	*−1.000*	3497	1747	2
F	*−0.217*	*−0.902*	*−0.931*	*−0.975*	*0.975*	917	−48
μ_μ/μ_p	*0.498*	*−0.112*	*−0.077*	*−0.002*	*0.002*	*−0.108*	215