Errata

Data Science Journal (2007) Vol. 6, S676-S689

A Multimeasurand ISO GUM Supplement is Urgent

V. V. Ezhela
Institute for High Energy Physics

Corrections made by the author after publication are listed below.

1. In Section 2.1, the third paragraph should read

> The eigenvalues are all positive, as they should be by definition of the correlation matrix: 2.403 564 371 235 8685, 0.596 435 606 493 034, 2.227 109 758 149 771 x 10^{-8} a

2. In Section 2.2 the first sentence should be replaced with:

> "In the paper of Abreu et al., [19] the measured results of τ topological branching ratios for the reactions:
> $B_1\left(\tau^- \to h^-\ neutrals\right),\ B_3\left(\tau^- \to h^+\ 2h^-\ neutrals\right),\ B_5\left(\tau^- \to 2h^+\ 3h^-\ neutrals\right),$
> are presented (see p. 636 and Table 6). Their data can be collected into the following data structure:

3. In Section 2.3, Table XII was split between two pages. For clarity sake, the entire table is reprinted below.

TABLE XII. Correlation coefficients between measurements of branching fractions.

C_τ	B_e	B_μ	B_h	B_μ/B_h	B_h/B_e
B_e	1	0.50	0.48	-0.42	-0.39
B_μ		1	0.50	0.58	0.08
B_h			1	0/07	0.53
B_μ/B_h				1	0.45
B_h/B_e					1

4. In Section 2.4, the table immediately after the first paragraph concatenated the values of the elementary charge and the Planck Constant for the CODATA:1998 values, as well as misspelling Planck. The corrected table is printed in its entirety below.

CODATA:1986 [21]	Symbol [Units]	Value (Uncertainty)×scale	Correlations		
Elementary charge	e [C]	1.602 177 33(49) ×10−19	e	h	m_e
Planck constant	h [J s]	6.626 075 5(40) ×10−34	**0.997**		
Electron mass	m_e [kg]	9.109 389 7(54) ×10−31	**0.975**	**0.989**	
1/α(0)	$\alpha(0)^{-1}$	137.035 989 5(61)	**−0.226**	**−0.154**	**−0.005**
CODATA:1998 [22]					
Elementary charge	e [C]	1.602 176 462(63) ×10−19	e	h	m_e
Planck constant	h [J s]	6.626 068 76(52) ×10−34	**0.999**		
Electron mass	m_e [kg]	9.109 381 88(72) ×10−31	**0.990**	**0.996**	
1/α(0)	$\alpha(0)^{-1}$	137.035 999 76(50)	**−0.049**	**−0.002**	**0.092**
CODATA:2002 [23]					
Elementary charge	e [C]	1.602 176 53(14) ×10−19	e	h	m_e
Planck constant	h [J s]	6.626 0693(11) ×10−34	**1.000**		
Electron mass	m_e [kg]	9.109 3826(16) ×10−31	**0.998**	**0.999**	
1/α(0)	$\alpha(0)^{-1}$	137.035 999 11(46)	**−0.029**	**−0.010**	**0.029**

5. In equation (12), *ubit* should be *unit*.

6. In Section 4, when quoting from ISO GUM 5.1.2, the first line contains *uc(y)* that should be $u_c(y)$.

7. In the same quotation, the unnumbered equation contains *δxi* in the second differential that should be δx_i.

8. References: The URLs cited in various references were not all correct. The entire Reference section is given below with corrected URLs.

7 REFERENCES

[1] BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, and OIML (1995) *Guide to the Expression of Uncertainty in Measurement*. ISBN 92-67-10188-9, Second Edition. ISOGUM

[2] B. N. Taylor, B. & and Kuyatt, C. (1994) *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*. NIST Technical Note 1297. NIST-GUM

[3] Slaev, V. (ed.) (1999) *Guide to the Expression of Uncertainty in Measurement* (Russian translation of the ISO GUM) - GP, VNIIM, S.-Petersburg.

[4] Cox, M. & Harris, P. (2003) The GUM and its planned supplemental guides. *Accred. Qual. Assur.* ***8,*** 375.

[5] Retrieved from the WWW, August 15, 2007: http://www.npl.co.uk/ssfm/.

[6] ISO/PRF Guide 99998, (2006) *Guide to the expression of uncertainty in measurement (GUM) – Supplement 1: Numerical methods for the propagation of distributions*, under development. GUM Supplement 1

[7] Cox, M. & Harris, P. (2006) *Uncertainty Evaluation. Best Practice Guide No. **6**. Software Support for Metrology*. NPL Report, DEM-ES-11, National Physics Laboratory, Teddington, UK.

[8] Cox, M. & Harris, P. (2004) *SSfM Best Practice Guide No **11**, Numerical analysis for algorithm design in Metrology*. Technical report, NPL, Teddington, UK.

[9] Fox, L. (1971) How to get meaningless answers in scientific computation (and what to do about it). *IMA Bulletin **7***, 296.

[10] Smith, D. (1991) *Probability, Statistics, and Data Uncertainties in Nuclear Science and Technology*. La-Grange Park, Illinois, USA: American Nuclear Society.

[11] Kahan, W. (1996) *The Improbability of PROBABILISTIC ERROR ANALYSES for Numerical Computations.* improber.pdf.

[12] De Bièvre, P. (1997) Measurement results without statements of reliability (uncertainty) should not be taken seriously. *Accred. Qual. Assur. **2**,* 269.

[13] Badikov, S.(1998) Statistical analysis of correlated data and evaluation of the neutron cross sections. *Atomic Energy **84***, 426 (in Russian).

[14] Siver, A. & Ezhela, V. (2003*) On the CODATA recommended values of the fundamental physical constants: V3.2 (1998) and V4.0 (2002)*. IHEP-2003-34.

[15] Cox, M. & Harris, P. (2004) *SSfM Best Practice Guide No **11**, Numerical analysis for algorithm design in metrology.* Technical report, NPL, Teddington, UK.

[16] Ezhela, V., Kuyanov, Y., Larin, V. & Siver, A. (2004) The Inconstancy of the Fundamental Physical Constants: Computational Status. *arXiv:physics/0409117*.

17] Slaev, V. *Recommendations on Application of the Document "Guide to the Expression of Uncertainty in Measurement" in Russia.* VNIIM-2000.

[18] Lira, I.(2002) *Evaluating the Measurement Uncertainty. Fundamentals and practical guidance*. IoP Publishing Ltd: Bristol and Philadelpha.

[19] Abreu, P. et al. [DELPHI Collaboration] (2001) A measurement of the tau topological branching Ratios. *European Physical Journal **C 20***, 617.

[20] Anastassov, A. et al. [CLEO Collaboration], (1998) *Physics Review **D 55** (1997)* 2559 [Erratum-ibid. **D 58**, 119904].

[21] Cohen, E. & Taylor, B. (1987) "The 1986 adjustment of the fundamental physical constants," *Review of Modern Physics 59*, 1121. CODATA-86.

[22] Mohr, P. & Taylor, B. (2000) CODATA recommended values of the fundamental physical constants: 1998. *Review of Modern Physics **72***, 351, CODATA-98.

[23] Mohr, P. & Taylor, B. (2005) CODATA recommended values of the fundamental physical constants: 2002. *Review of Modern Physics **77***, 1. Constants2002

[24] Grigoriev, I. & Meilikhov, E. (eds.) (1991) Physical Quantities (in Russian). *M. Energoatomizdat.*

[25] Radtsig, A. (2003) "Fundamental Physical Constants (1998)" (Russian translation of an excerpt from Ref.[22]). *UFN **173***, 339.

[26] Yao, W. et al. [Particle Data Group], (2006) Review of Particle Physics. *Journal of Physics* ***G 33***, 1.

[27] Karshenboim, S. (2005) Fundamental physical constants: their role in physics and metrology and recommended values (in Russian). *UFN* ***175***, 271.

[28] Lide, D. (ed.) (2005) *Handbook of Chemistry and Physics.* ***85th*** *Edition.* CRC Press.

[29] Ezhela, V., Kuyanov, Y., Larin, V. &. Siver, A. (2004) The Inconstancy of the Fundamental Physical Constants: Computational Status. *arXiv:physics/0409117.*

[30] Wilkinson, J. (1965) *The Algebraic Eigenvalue Problem*. Clarendon Press: Oxford.

[31] Gantmakher, F. (1988) *Matrix Theory* (in Russian). M. – Nauka.

[32] Horn, R. & Johnson, C. (1986) *Matrix Analysis*. Cambridge University Press.

[33] Rohn, J. (2005) Nonsingularity, Positive Definiteness, and Positive Invertibility Under Fixed-Point Data Rounding. submitted to *Applications of Mathematics, September 2005*; MSTeP
Rohn, J. (2007) Nonsingularity, Positive Definiteness, and Positive Invertibility Under Fixed-Point Data Rounding. *Applications of Mathematics* ***52*** *(2)*, 105-115.

[34] Anderson, T. (1963) *An Introduction to Multivariate Statistical Analysis*. New York: John Willey & Sons, Inc.

[35] Borovkov, A. (1984) *Mathematical Statistics. Parameter Estimations. Hypotheses Testing* (in Russian). M. –Nauka.

[36] D'Agostini, G. (2003) *Bayesian Reasoning in Data Analysis*. World Scientific Publishing Co. Pte. Ltd.

[37] De Bièvre, P. (1997) Reliability is a State-of-the-Mind. *Accred. Qual. Assur.* ***2***, 1.

[38] M. Herman, M. (ed.) (2005) ENDF- 6 Formats Manual. Data Formats and Procedures for the Evaluated Nuclear Data File ENDF/B-VI and ENDF/B-VIIN. Document ENDF-102, Report BNL-NCS-44945- 05-Rev. ENDF-102

[39] Ferson, S. et al. (2004) Dependence in probabilistic modeling, Dempster-Shafer theory, and probability bounds analysis. *SAND2004-3072*. Unlimited release, Printed. Pp. 59-60,107. SAND2004-3072

[40] Wang, C. & Iyer, H. (2005) On higher-order corrections for propagating uncertainties. *Metrologia* ***42***, 406.

[41] Ferson, S. et al. (2006) Experimental uncertainty estimation and statistics for data having interval uncertainty. SAND2006-XXXX [review draft 2], Unlimited release, Printed XXXX 2006, SAND2006-XXXX