Erratum: Absolute Frequency Measurements of the $2\,^3S_1 \rightarrow 2\,^3P_{0,1,2}$ Atomic Helium Transitions around 1083 nm [Phys. Rev. Lett. 92, 023001 (2004)]

P. Cancio Pastor, G. Giusfredi, P. De Natale, G. Hagel, C. de Mauro, and M. Inguscio

(Received 12 September 2006; published 28 September 2006)

DOI: 10.1103/PhysRevLett.97.139903 PACS numbers: 31.30.Jv, 06.30.Ft, 42.62.Eh, 99.10.Cd

There is an error in the sign of the calculated second order Doppler shift correction included in the third line of Table I for the frequency of the three measured transitions. We became aware of this error while testing the computation program to be used for ^{3}He isotope calculations. Table I summarizes the corrected values for these shifts and for f_0, f_1, and f_2 frequencies. The error also shifts the values of the centroid frequency f_c, the QED contribution to the $2\,^3S - 2\,^3P$ energy [$\Delta E_{\mathrm{QED}}(2\,^3S - 2\,^3P)$, and the $2\,^3P$ Lamb shift [$E_{\mathrm{QED}}(2\,^3P)$]. The new values are listed in the first line of Table II. In the same table, the uncertainty of the previous f_c measurement [6] (line 2, column 1 of Table II) is 70 kHz instead of 7 kHz, due to a misprint. All conclusions discussed in the Letter remain unaltered by these frequency corrections.

[1] C. H. Storry, M. C. George, and E. A. Hessels, Phys. Rev. Lett. **84**, 3274 (2000).
[2] F. Minardi, G. Bianchini, P. C. Pastor, G. Giusfredi, F. S. Pavone, and M. Inguscio, Phys. Rev. Lett. **82**, 1112 (1999).
[3] G. Giusfredi, P. De Natale, D. Mazzotti, P. Cancio Pastor, C. de Mauro, L. Fallani, G. Hagel, V. Krachmalnicoff, and M. Inguscio, Can. J. Phys. **83**, 301 (2005).
[4] M. C. George, L. D. Lombardi, and E. A. Hessels, Phys. Rev. Lett. **87**, 173002 (2001).
[5] J. Castillega, D. Livingston, A. Sanders, and D. Shiner, Phys. Rev. Lett. **84**, 4321 (2000).
[6] D. Shiner, R. Dixson, and P. Zhao, Phys. Rev. Lett. **72**, 1802 (1994).
[7] C. Dorrer, F. Nez, B. de Beauvoir, L. Julien, and F. Biraben, Phys. Rev. Lett. **78**, 3658 (1997).
[8] K. Pachucki, J. Phys. B **35**, 3087 (2002).
[9] K. Pachucki, Phys. Rev. Lett. **84**, 4561 (2000).

TABLE I. Absolute frequency measurements of $2\,^3S_1 \rightarrow 2\,^3P_{0,1,2}$ ^{4}He transitions: statistical results and systematic error budget. $f_{0,1,2}$ are, respectively, the frequencies of the $2\,^3S_1 \rightarrow 2\,^3P_{0,1,2}$ transitions.

Transition[a]	$\mathbf{f_0}$ (kHz)	$\mathbf{f_1}$ (kHz)	$\mathbf{f_2}$ (kHz)
Statistical value	276 764 094 746.9(1.3)	276 734 477 805.0(0.9)	276 732 186 818.4(1.5)
First order Doppler shift	(1.6)	(1.6)	(1.6)
RS + LS + 2nd DS[b]	−39.6(0.2)	−52.5(0.7)	−197.9(14.0)
Zeeman shift[c]	(0.1)	(0.1)	(0.1)
Final result	**276 764 094 707.3(2.1)**	**276 734 477 752.5(2.0)**	**276 732 186 620.5(15.0)**

[a]Uncertainties are given in parentheses.
[b]RS: Recoil-induced shift; LS: light shift; and 2nd DS: Second order Doppler shift.
[c]Because of residual magnetic fields ($<0.03\ \mu$T).

TABLE II. Comparison with previous measurements and theory. f_c is the spin-averaged frequency of $2\,^3S \rightarrow 2\,^3P_{0,1,2}$ transitions. $\Delta E_{\mathrm{QED}}(2\,^3S - 2\,^3P)$ and $E_{\mathrm{QED}}(2\,^3P)$ are, respectively, the $2\,^3S \rightarrow 2\,^3P$ and $2\,^3P$ Lamb shift energies.

[a]	f_c (kHz)	$\mathbf{\Delta E_{QED}(2^3S - 2^3P)}$ (MHz)	$\mathbf{E_{QED}(2^3P)}$ (MHz)
This work + $2\,^3P$ FS[b]	276 736 495 653.1(2.4)	5311.2109(35)	−1253.978(58)
Previous measurements[c]	276 736 495 580(70)	5311.27(7)	−1253.9(1)
Theory[d]	276 736 496 100(1100)	5312.3(1.1) [e]	−1253.75(40)

[a]Uncertainties are given in parentheses.
[b]$f_{2\,^3P_{0-1}} = 29\,616\,951.4(1.3)$ kHz [1–3], $f_{2\,^3P_{1-2}} = 2\,291\,175.3(0.9)$ kHz [4,5].
[c]From [6,7].
[d]From [8,9].
[e]Determined from $E_{\mathrm{QED}}(2\,^3S) - E_{\mathrm{QED}}(2\,^3P)$.

