Erratum

On the time-dependent analysis of Gamow decay
Detlef Dürr, Robert Grummt and Martin Kolb 2011 *Eur. J. Phys.* **32** 1311–1321

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The publisher regrets that a number of corrections to this paper were not made during typesetting. The paper should be amended as follows.

- On page 1315, the paragraph relating to and directly following equation (13) should read as follows.

Observe that the remaining integral is essentially the Fourier transformation of the Breit–Wigner function $1/[(k^2 - E)^2 + \Gamma^2]$. The only two differences are the appearance of an additional function $|\tilde{f}(k)|^2$ and the integration over $k$ instead of $k^2$. Thus we can solve the integral by changing the integration variable…

- On page 1316, the last paragraph should begin as follows.

However, we choose a different route by setting $c_\pm = 1$. Functions $f_\pm$, $a_\pm$ and $b_\pm$ are then analytic in $k$, because $f_\pm$ is analytic in $k$ for $x > L$ $(x < -L)$ and therefore needs to be analytic in $k$ for all $x$.

- On page 1318, in the penultimate paragraph the last but one sentence should read as follows.

The function $\tilde{I}_LG_{\pm}$ is peaked at $k = \text{Re} \, z$, because for $k \approx \text{Re} \, z$ we have $u_\pm(k, x) \approx G(x)$ if $\Gamma \ll 1$.

- On page 1319, section 2.3 ‘Example’ should begin as follows.

Now we consider the double well potential (see figure 1) and use it as a model for $\alpha$-decay. In this section we continue working with units in which $m = 1/2$ and $\hbar = 1$ to keep formulae short. However, to provide a feeling for dimensions we will give some of the results in SI units. In this regard note that, if Schrödinger’s equation is used to describe $\alpha$-decay, the mass $m$ that appears in Schrödinger’s equation when written in SI units does not refer to electron mass, but the mass of an $\alpha$-particle ($6.69 \times 10^{-27}$ kg).

- On page 1319, the second sentence following equation (30) should read as follows.

Uranium 234, for example, has an experimentally measured $\alpha$-decay rate of $\Gamma_{\text{exp}} = 1.2936 \times 10^{-13}$ 1/s (see [15]).

- On page 1319, equation (32) should read

\[
G(x) = c \begin{cases} 
  e^{-izx}, & x < -(\ell + \delta) \\
  d_1(z) \cos(\zeta x) + ia_2(z) \sin(\zeta x), & |x| \leqslant \ell \\
  e^{izx}, & x > \ell + \delta.
\end{cases}
\]
• On page 1321, reference [12] should be updated as follows.

[12] Grummt R 2009 On the time-dependent analysis of Gamow decay
Master’s thesis Ludwig-Maximilians-University Munich arXiv:0909.3251