Erratum: Electromagnetic transitions of ($b\bar{c}$) bound system **[Phys. Rev. D **97**, 056025 (2018)]**

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An error was detected in our paper while revisiting the calculation leading to the momentum-space projection of the quark orbitals derivable in the relativistic independent quark (RIQ) model. The error was due to a relative sign mistake that entered into the calculation of the lower components of the quark orbitals for 2s and 3s meson states. With this relative sign mistake, our calculation led to model expressions for momentum probability amplitude $G_b(\vec{p}_b)$ and $\tilde{G}_c(\vec{p}_c)$ corresponding to orbitally excited meson states ($n = 2, 3$; $l = 0$) which were shown in Eqs. (A7) and (A9) in the Appendix of our published paper. Taking into account the correct relative sign, the corresponding expressions are found in the following form:

For the excited meson state ($n = 2$, $l = 0$):

$$\begin{aligned} G_b(\vec{p}_b) &= \frac{i\pi\mathcal{N}_b}{2\alpha_b} \sqrt{\frac{(E_{p_b} + m_b)}{E_{p_b}}} \frac{(E_{p_b} + E_b)}{(E_b + m_b)} \left(\frac{\vec{p}_b^2}{2\alpha_b} - \frac{3}{2} \right) \exp\left(-\frac{\vec{p}_b^2}{4\alpha_b}\right) \\ \tilde{G}_c(\vec{p}_c) &= \frac{i\pi\mathcal{N}_c}{2\alpha_c} \sqrt{\frac{(E_{p_c} + m_c)}{E_{p_c}}} \frac{(E_{p_c} + E_c)}{(E_c + m_c)} \left(\frac{\vec{p}_c^2}{2\alpha_c} - \frac{3}{2} \right) \exp\left(-\frac{\vec{p}_c^2}{4\alpha_c}\right). \end{aligned} \quad (\text{A7})$$

For the excited meson state ($n = 3$, $l = 0$):

$$\begin{aligned} G_b(\vec{p}_b) &= \frac{i\pi\mathcal{N}_b}{2\alpha_b} \sqrt{\frac{(E_{p_b} + m_b)}{E_{p_b}}} \frac{(E_{p_b} + E_b)}{(E_b + m_b)} \left(\frac{\vec{p}_b^4}{8\alpha_b^2} - \frac{5\vec{p}_b^2}{4\alpha_b} + \frac{15}{8} \right) \exp\left(-\frac{\vec{p}_b^2}{4\alpha_b}\right) \\ \tilde{G}_c(\vec{p}_c) &= \frac{i\pi\mathcal{N}_c}{2\alpha_c} \sqrt{\frac{(E_{p_c} + m_c)}{E_{p_c}}} \frac{(E_{p_c} + E_c)}{(E_c + m_c)} \left(\frac{\vec{p}_c^4}{8\alpha_c^2} - \frac{5\vec{p}_c^2}{4\alpha_c} + \frac{15}{8} \right) \exp\left(-\frac{\vec{p}_c^2}{4\alpha_c}\right) \end{aligned} \quad (\text{A8})$$

The binding energies of the constituent quark and antiquark for the ground and orbitally excited B_c , B_c^* states can also be obtained by solving the respective cubic equations representing the appropriate bound state conditions for $n = 1, 2, 3$ and $l = 0$.

Using expressions for $G_b(\vec{p}_b)$ and $\tilde{G}_c(\vec{p}_c)$ for the meson ground state ($n = 1$; $l = 0$) and the revised expressions (A7) and (A8) corresponding to the orbitally excited meson states ($n = 2, 3$; $l = 0$), the decay width for different allowed transitions was evaluated. The revised Table I provides our predictions for the $1^3S_1 \rightarrow 1^1S_0$ transition as well as for all other allowed transitions involving orbitally excited meson states. Although our predictions for the later category of transitions are found to be different from previous predicted values as expected, they are consistent with model predictions based on the Bethe-Salpeter approach [1]. The q^2 dependence of transition form factors $F_{B_c^*B_c}(q^2)$ and $F_{B_cB_c^*}(q^2)$ for energetically possible transitions of the type $V \rightarrow Pe^+e^-$ and $P \rightarrow Ve^+e^-$, respectively, involving ground and orbitally excited states of B_c family members also remain consistent with the predictions reported earlier in the published paper. The correction does not affect our conclusions in a qualitative sense.

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TABLE I. Comparison of the theoretical prediction on decay rates (in keV) for several electromagnetic transitions.

Transitions	Present work	[1]
$1^3S_1 \rightarrow 1^1S_0$	0.7112×10^{-5}	8.64×10^{-5}
$2^3S_1 \rightarrow 2^1S_0$	0.2146×10^{-4}	...
$3^3S_1 \rightarrow 3^1S_0$	0.9357×10^{-4}	...
$2^3S_1 \rightarrow 1^1S_0$	2.6932×10^{-3}	1.59×10^{-3}
$3^3S_1 \rightarrow 2^1S_0$	0.8978×10^{-3}	...
$3^3S_1 \rightarrow 1^1S_0$	1.4455×10^{-3}	2.11×10^{-3}
$2^1S_0 \rightarrow 1^3S_1$	7.1296×10^{-3}	1.65×10^{-3}
$3^1S_0 \rightarrow 2^3S_1$	1.0396×10^{-3}	1.41×10^{-3}
$3^1S_0 \rightarrow 1^3S_1$	5.6111×10^{-3}	0.42×10^{-3}

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[1] H. Ke, G. Wang, X. Li, and C. Chang, *Sci. China Phys. Mech. Astron.* **53**, 2025 (2010).