Erratum: Lattice study of the two-photon decay widths for scalar and pseudo-scalar charmonium [Chin. Phys. C 44(8), 083108 (2020)]

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It is bought to the authors' attention from a recent study [1] that, one should consider the final state photon exchange symmetry in the process of two-photon decay widths for various charmonia. This renders the form factors in Eq. (23)-Eq. (26) of the original paper differ by a factor of two and the final decay width by a factor of four. Therefore, Eq. (23)-Eq. (26) now should read,

$$
\begin{aligned}
F(0,0)_{B1} &= 2 \times 0.1283(1)(3)(77)\,, \\
&= 0.2566(2)(6)(154)
\end{aligned} \tag{1}
$$

$$
\begin{aligned}
F(0,0)_{C1} &= 2 \times 0.1240(4)(13)(68)\,, \\
&= 0.248(8)(26)(136)
\end{aligned} \tag{2}
$$

$$
\begin{aligned}
G(0,0)_{B1} &= 2 \times 0.1017(7)(102)(126)\,, \\
&= 0.2034(14)(204)(252)
\end{aligned} \tag{3}
$$

$$
\begin{aligned}
G(0,0)_{C1} &= 2 \times 0.0907(8)(19)(90)\,, \\
&= 0.1814(16)(38)(180)\,,
\end{aligned} \tag{4}
$$

and the decay widths shown in Eq.(27) of the original paper should be modified to the following:

$$
\begin{aligned}
\Gamma(\eta_c \to \gamma\gamma)_{B1} &= 4 \times 1.62(19)\ \text{KeV}, \\
&= 6.48(76)\ \text{KeV},
\end{aligned} \tag{5}
$$

$$
\begin{aligned}
\Gamma(\eta_c \to \gamma\gamma)_{C1} &= 4 \times 1.51(17)\ \text{KeV}, \\
&= 6.04(68)\ \text{KeV},
\end{aligned} \tag{6}
$$

$$
\begin{aligned}
\Gamma(\chi_{c0} \to \gamma\gamma)_{B1} &= 4 \times 1.18(38)\ \text{KeV}, \\
&= 4.72(152)\ \text{KeV},
\end{aligned} \tag{7}
$$

$$
\begin{aligned}
\Gamma(\chi_{c0} \to \gamma\gamma)_{C1} &= 4 \times 0.93(19)\ \text{KeV}, \\
&= 3.72(76)\ \text{KeV}.
\end{aligned} \tag{8}
$$

The decay widths are now in better agreement with the experiment values.

References

[1]   Zuoheng Zou, Yu Meng, and Chuan Liu, Lattice calculation of $\chi_{c0} \to 2\gamma$ decay width, 11 (2021), arXiv:2111.00768