

**Erratum: Constructing the  $J^{P(C)} = 1^{-(+)}$  light flavor hybrid nonet  
with the newly observed  $\eta_1(1855)$   
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In the paper, we made a mistake in the calculations. Specifically, we took the  $\beta_{1^3P_J}$  ( $J = 0, 1, 2$ ) for the  $b_1(1235)$  state when we calculated the partial width of  $\pi_1(1600) \rightarrow b_1(1235)\pi$  process. Here, we removed this mistake and examined the calculations. We used the  $\beta_{1^1P_J}$  ( $J = 0, 1, 2$ ) for the  $b_1(1235)$  state. In addition, we considered all possible ways for the created  $q\bar{q}$  to recombine with the quark-antiquark pair of the initial meson to form two final mesons.

TABLE I. The partial and total widths of the strong decays of the  $\pi_1(1^{--})$  state (MeV). Here, the final mesons refer to all allowed charge conjugate pairs. For example, when we consider the  $\pi_1(1600)^-$  decaying into the  $K^*(892)$  and  $K$  states, the  $K^*K$  denotes the  $K^*(892)^- + K^0$  and  $K^*(892)^0 + K^-$  channels. The original results are listed in parentheses for a direct comparison.

| $\rho\pi$ | $K^*K$                      | $b_1(1235)\pi$ | $f_1(1285)\pi$ | $f_2(1270)\pi$              |
|-----------|-----------------------------|----------------|----------------|-----------------------------|
| 5 (2)     | $\approx 0$ ( $\approx 0$ ) | 188 (244)      | <b>44</b> (15) | $\approx 0$ ( $\approx 0$ ) |
|           |                             |                | Total          | Exp. [11]                   |
|           |                             |                | 237 (261)      | $240 \pm 50$                |

TABLE II. The partial and total widths of the strong decays of the  $\eta_1(1^{--})$  state (MeV).

| $\eta\eta'$                 | $K^*K$                      | $a_1(1260)\pi$  | $a_2(1320)\pi$              | $\pi(1300)\pi$ |
|-----------------------------|-----------------------------|-----------------|-----------------------------|----------------|
| $\approx 0$ ( $\approx 0$ ) | $\approx 0$ ( $\approx 0$ ) | <b>169</b> (55) | $\approx 0$ ( $\approx 0$ ) | 17 (5)         |
|                             |                             |                 | Total                       | Exp.           |
|                             |                             |                 | <b>186</b> (60)             | ...            |

TABLE III. The partial and total widths of the strong decays of the  $\eta'_1(1^{--})$  state (MeV).

| $\eta\eta'$                 | $K^*K$ | $K_1(1270)K$     | Total            | Exp. [40,41]           |
|-----------------------------|--------|------------------|------------------|------------------------|
| $\approx 0$ ( $\approx 0$ ) | 4 (2)  | <b>239</b> (157) | <b>243</b> (159) | $188 \pm 18^{+3}_{-8}$ |

TABLE IV. The partial and total widths of the strong decays of the  $K_1(1^-)$  state where the mass of the  $K_1(1^-)$  state is taken as 1.72 GeV (MeV).

| $K\pi$          | $K\eta$                     | $K\eta'$                    | $K\rho$                     | $K\omega$                   |
|-----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 2 (1)           | 1 (0)                       | $\approx 0$ ( $\approx 0$ ) | $\approx 0$ ( $\approx 0$ ) | $\approx 0$ ( $\approx 0$ ) |
| $K^*\pi$        | $K^*\eta$                   | $K^*\rho$                   | $K^*\omega$                 | $K_1(1270)\pi$              |
| 4 (3)           | 1 (1)                       | $\approx 0$ ( $\approx 0$ ) | $\approx 0$ ( $\approx 0$ ) | <b>75</b> (106)             |
| $K_1(1400)\pi$  | $K_2(1430)\pi$              | $h_1(1116)K$                | $K(1460)\pi$                | $K^*(1410)\pi$              |
| <b>65</b> (146) | $\approx 0$ ( $\approx 0$ ) | 25 (16)                     | 3 (2)                       | 4 (3)                       |
|                 |                             |                             | Total                       | Exp.                        |
|                 |                             |                             | <b>180</b> (278)            | ...                         |

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Accordingly, we redetermined the parameter  $g_s = 0.26$  in the constituent gluon model. With the new value of  $g_s$ , we update the results of  $\pi_1(1^{-+})$ ,  $\eta_1(1^{-+})$ ,  $\eta'_1(1^{-+})$ , and  $K_1(1^-)$  states in Tables I–IV which correspond to Tables IV–VII in the published version. For the convenience of readers, we also list the original results in parentheses for a direct comparison. When a significant change exists between the updated value and the original result, we highlight the updated values in boldface.

The main conclusions of our paper are unaltered. The  $\pi_1(1600)$  and  $\eta_1(1855)$  could be assigned to the  $J^{P(C)} = 1^{-(+)}$  light flavor hybrid nonet. However, the decay width of  $1^{-+} \eta_1 [(u\bar{u} + d\bar{d})g/\sqrt{2}]$  is predicted to be 186 MeV, which is much broader than our previous result. Then the  $\eta_1$  seems to be a broad state rather than a narrow state. The width of  $K_1$  is predicted to be about 180 MeV, which is narrower than our previous result. Nonetheless, the main decay channels of  $\eta_1$  and  $K_1$  remain unchanged. In addition, the prediction of branch ratio  $\mathcal{B} = \frac{\Gamma(\pi_1(1600) \rightarrow b_1(1235)\pi)}{\Gamma(\pi_1(1600) \rightarrow f_1(1285)\pi)}$  is revised as 4.3.

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