Erratum: Dalitz plots and lineshape of $a_1(1260)$ from a relativistic three-body unitary approach [Phys. Rev. D **101**, 094018 (2020)]

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In Eq. (5) of this paper a factor of $1/2$ is missing. The equation should read:

$$\Sigma(\sigma(p)) = \frac{1}{2} \int_0^\infty \frac{dk k^2}{(2\pi)^3 E_k} \frac{\tilde{v}(\sigma(p), k) \tilde{v}^*(\sigma(p), k)}{\sigma(p) - 4E_k^2 + i\epsilon}. \quad (1)$$

The free parameters of the framework are m_ρ , g_1 , Λ , g_{fL} , D_{fL} , $D_{f\bar{f}}$, m_{fit} , where three former are fixed by a fit to the two-body data, i.e., isovector $\pi\pi$ phase-shifts. They read: $m_\rho = 1.82$ GeV, $g_1 = 7.23$, and $\Lambda = 1.58$.

With this change, the fit to the ALEPH line shape data of Ref. [1] changes, resulting in the parameter set $D_{f0} = 1.4 \times 10^{-4}$ GeV $^{-1/2}$, $D_{f2} = 2.7 \times 10^{-5}$ GeV $^{-1/2}$, $D_{f\bar{f}} = 2.7 \times 10^{-7}$ GeV $^{-1/2}$, $g_{f0} = 2.8 \times 10^3$, $g_{f2} = 1.09$, and $m_{\text{fit}} = 1.232$ GeV. The result of the modified fit is presented in Fig. 1 together with the experimental data. Compared to the results of the published paper the D -wave contribution to the line shape is even smaller so that the S -wave contribution and the combined S plus D -wave line shape are barely distinguishable. The new fit changes also the outcome for the Dalitz plots shown in Fig. 2. Compared to this paper, the only noticeable change occurs in the bottom row for which the results deviate less from one by a factor of about three. This means that in this erratum the rescattering effects (“connected part”) are found to be even smaller than in this paper. The estimate of the branching ratio to D -wave changed from 1.5% to 0.25% [PDG [2]: $(1.3 \pm 0.6 \pm 0.22)\%$].

FIG. 1. (Replaces Fig. 7 of published paper.) Three-pion line shape from the decay $\tau^- \rightarrow \pi^- \pi^- \pi^+ \nu_\tau$ (data from Ref. [1]). The solid blue line shows the fit result. We also include the component of the fit that comes only from the S -wave (red dashed line).

FIG. 2. (Replaces Fig. 8 of published paper.) Upper row: Dalitz plots for various three-body invariant masses. Each Dalitz plot has been re-scaled separately to emphasize qualitative features. The blue/red colors represent higher/lower values, respectively. The dark bands at $\sigma_{13}, \sigma_{23} \sim 0.59 \text{ GeV}^2$ are the outline of the ρ -meson. Middle row: projected Dalitz plots. An effect of this integration is the kinematic reflection of the peak from the ρ meson at a value of σ_{13} lower than the mass of the ρ . Lower row: the ratio between $\mathcal{D}_p$ and $\mathcal{D}'_p$, the equivalent projected Dalitz plots calculated without the rescattering terms normalized to the integral over $\mathcal{D}_p$.

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- [2] P. Zyla *et al.* (Particle Data Group), *Prog. Theor. Exp. Phys.* **2020**, 083C01 (2020).