Erratum: Generalized quantum state discrimination problems [Phys. Rev. A 91, 052304 (2015)]

Kenji Nakahira , Kentaro Kato, and Tsuyoshi Sasaki Usuda

(Received 17 December 2020; published 5 January 2021)

DOI: [10.1103/PhysRevA.103.019902](https://doi.org/10.1103/PhysRevA.103.019902)

The second paragraph below Eq. (18) of our work (which starts with “Slater’s condition”) should read: “Slater’s condition is known to a sufficient condition under which, if the primal problem is convex, the optimal values of the primal and dual problems are the same [31]. Let $\lambda_j = 1$ for each j ; then, there exists $\hat{X}$ such that $\hat{X} - \hat{z}_m(\lambda)$ is positive definite for any $m \in \mathcal{I}_M$, and, thus, Slater’s condition holds. Therefore, the optimal values of problems (2) and (12) are the same.”

The first full paragraph below Eq. (27) (which starts with “We can see that”) should read “ (μ^*, Π^*) is called a saddle point, also referred to as a minimax solution, of $F(\mu, \Pi)$ if

$$F(\mu^*, \Pi) \leq F(\mu^*, \Pi^*) \leq F(\mu, \Pi^*) \quad (28)$$

holds for any $\mu \in \mathcal{P}$ and $\Pi \in \mathcal{M}^\circ$. A saddle point exists if and only if the so-called minimax theorem, that is,

$$\max_{\Pi \in \mathcal{M}^\circ} \min_{\mu \in \mathcal{P}} F(\mu, \Pi) = \min_{\mu \in \mathcal{P}} \max_{\Pi \in \mathcal{M}^\circ} F(\mu, \Pi) \quad (29)$$

holds, and this value equals $F(\mu^*, \Pi^*)$ [37]. We can see that if $\mathcal{M}^\circ$ is not empty, then the minimax theorem holds. Indeed, $\mathcal{M}^\circ$ and $\mathcal{P}$ are closed convex sets, and $F(\mu, \Pi)$ is a continuous convex function of μ for fixed Π and a continuous concave function of Π for fixed μ , which are sufficient conditions for the minimax theorem to hold [37]. We call μ^* and Π^* , respectively, minimax probabilities and a minimax measurement.”

[31] M. Slater, Cowles Comm. Discuss. Paper, Math. No. 403 (1950).

[37] I. Ekeland and R. Temam, *Convex Analysis and Variational Problems* (SIAM, North-Holland, 1999), Vol. 28.