# Erratum: Quantifying environment nonclassicality in dissipative open quantum dynamics [Phys. Rev. A 108, 042203 (2023)]

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The limit in Eq. (11) is valid under a mixing hypothesis, that is, the interaction Hamiltonian couples all states of the system with the environment (the stationary state does not depend on the initial condition). Under this condition, Eq. (12) is also valid. Nevertheless, the maximization over $\rho_0$ leads to two solutions, one with the maximal eigenvalue (original result) and another possible one with the minimal eigenvalue. Hence, Eq. (13) should read

$$D_Q = \max\left(D_Q^{\max}, D_Q^{\min}\right), \tag{13}$$

whereas the original solution is

$$D_Q^{\max} \equiv \dim(\mathcal{H}_s)\max(\{\lambda_i\}) - 1,$$

while the alternative extra one is set by

$$D_Q^{\min} \equiv 1 - \dim(\mathcal{H}_s)\min(\{\lambda_i\}).$$

Here $\min(\{\lambda_i\}$ is the smallest eigenvalue of $\tilde{\rho}_\infty$. Similarly, depending on (the corrected) $D_Q$, the corresponding initial condition in Eq. (13) is $\rho_0 = |i_{\max}\rangle\langle i_{\max}|$ or $\rho_0 = |i_{\min}\rangle\langle i_{\min}|$. For two-level systems, $D_Q^{\max}$ and $D_Q^{\min}$ lead to the same solution for $D_Q$. Alternative solutions could arise in higher-dimensional Hilbert spaces. In spite of this modification, the rest of the paper's results and examples remain the same.

Extending the paper's results, it is simple to rewrite Eq. (12) as

$$\frac{D_Q}{\dim(\mathcal{H}_s)} = \max_{[\rho_0]}\left|\mathrm{Tr}_s\left[\rho_0\left(\tilde{\rho}_\infty - \frac{I_s}{\dim(\mathcal{H}_s)}\right)\right]\right|. \tag{12}$$

Thus, $D_Q/\dim(\mathcal{H}_s)$ has the same properties as a trace distance [1], here defined between the stationary state $\tilde{\rho}_\infty$ and the totally mixed state $I_s/\dim(\mathcal{H}_s)$. This result is consistent with the above explicit expression for $D_Q$.

[1] M. A. Nielsen and I. L. Chuang, *Quantum Computation and Quantum Information* (Cambridge University Press, Cambridge, 2000).

 