# Erratum: Subspace stabilization analysis for a class of non-Markovian open quantum systems [Phys. Rev. A 101, 042327 (2020)]

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In Sec. IV of our paper, the proof of Theorem 2 (Subspace attractivity) should be corrected. The article text starting from "The negative definiteness of..." to the end of the proof of Theorem 2 should be replaced as follows:

Since

$$-2\gamma(0)L_P^\dagger L_P + \int_t^\infty \|\Omega(\tau,t)\|d\tau\, I \leqslant \alpha I,$$

it holds that $\dot{V}(t,\sigma(\cdot)) \leqslant \mathrm{tr}[\mathcal{K}(t)\sigma_0]$. Because $\gamma \in L^1[0,\infty)$ and other time-dependent terms are oscillatory and bounded, $\mathrm{tr}[\mathcal{K}(t)\sigma_0]$ is an $L^1$ function on $[0,\infty)$. According to Lemma 2,

$$2\gamma(0)L_P^\dagger L_P - \int_t^\infty \|\Omega(\tau,t)\|d\tau\, I \geqslant |\alpha| I,$$

where $|\alpha| > 0$. Therefore,

$$|\alpha|\mathrm{tr}(\sigma) \leqslant -\dot{V}(t,\sigma(\cdot)) + \mathrm{tr}[\mathcal{K}(t)\sigma_0].$$

Next, for $\forall t > 0$:

$$|\alpha| \int_0^t \mathrm{tr}[\sigma(s)]ds \leqslant -V(t,\sigma(\cdot)) + \int_0^t \mathrm{tr}[\mathcal{K}(s)\sigma_0]ds.$$

Therefore, $F(t) \triangleq \int_0^t \mathrm{tr}[\sigma(s)]ds$ admits a finite limit when $t$ tends to infinity. Because of the boundedness of density matrices, $\ddot{F}(t) = \mathrm{tr}[\dot{\sigma}]$ is bounded. Barbalat's lemma then says that $\dot{F}(t) = \mathrm{tr}[\sigma] \to 0$. It follows that $\sigma(t) \to 0$. The proof is complete. ■

 