Erratum: Shortcuts to adiabaticity for non-Hermitian systems [Phys. Rev. A 84, 023415 (2011)]

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In the original paper, the adiabaticity criterion of Eq. (17) is only appropriate when a number of conditions, that were not made explicit, are satisfied. They hold approximately for the example in Sec. IV C but should be stated.

We first assume a "weak–non-Hermiticity regime" [1] so that the adiabatic solutions in Eqs. (10) and (11) hold with adiabatic phases given by Eqs. (14) and (15) [2,3]. In Sec. II A, the "parallel transport" condition, namely, $\langle \hat{n}|\dot{n}\rangle = 0$ must be satisfied so that Eq. (19) holds true. Equation (20), which is only an order-of-magnitude estimate as in Ref. [4], follows from approximating the integral in Eq. (19) with constant functions $\langle \hat{n}|\dot{m}\rangle$ and $E_n - E_m$ and imposing again weak non-Hermiticity, in particular, that $\exp\{-\int_0^t \mathrm{Im}[E_n(t') - E_m(t')]dt'\} \approx 1$.

There is also an error in Sec. III: The phases $\xi_n(t)$ should obey $\xi_n(t_f) = \beta_n(t_f) + \delta_n$ with δ_n real at the final time t_f. Finally, in the paragraph before Eq. (29), "populations" should be substituted by "component norms." The population concept is problematic due to the normalization ambiguity for non-Hermitian systems [5].

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