Erratum: Hacking Alice's box in continuous-variable quantum key distribution [Phys. Rev. A **98**, 062319 (2018)]

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(Received 5 October 2020; published 28 December 2020)

DOI: [10.1103/PhysRevA.102.069903](https://doi.org/10.1103/PhysRevA.102.069903)

In Sec. II B, the final paragraph, beginning “It is helpful to clarify...,” has typographical errors in two of the inline equations. Specifically, $\beta = \eta(\alpha + n)$ should read $\beta = \sqrt{\eta}(\alpha + n)$, and $\beta = \eta'(k\alpha + n')$ should read $\beta = \sqrt{\eta'}(k\alpha + n')$. These are typographical errors and do not affect any future calculations.

In Sec. III, the paragraph beginning “If the modulator can be surrounded...” has an incorrect proof of Eqs. (41) and (42). Specifically, the two sentences beginning with “The conditional state...” and including Eqs. (39) and (40) are wrong (up to the sentence beginning with “If the Trojan horse mode...”). They should instead read as follows:

The conditional state $\psi_{E_S, E_I}|\alpha$ received by Eve after the side channel (conditioned on Alice's value) is an attenuated two-mode squeezed vacuum (TMSV) state. It has the covariance matrix,

$$V_{E_S, E_I}|\alpha = \begin{pmatrix} (2\bar{n} + 1)\mathbf{1} & 2\sqrt{\bar{n}'(\bar{n} + 1)}\mathbb{Z} \\ 2\sqrt{\bar{n}'(\bar{n} + 1)}\mathbb{Z} & (2\bar{n}' + 1)\mathbf{1} \end{pmatrix}, \quad (1)$$

where $\bar{n}$ is the photon number of the TMSV state prior to the side channel, $\bar{n}'$ is some positive real number less than $\bar{n}$, E_S is the signal mode, and E_I is the idler mode.

Let $\psi_{E_S E_I P}|\alpha$ be the purification of $\psi_{E_S, E_I}|\alpha$. Eve does not hold the purifying mode P , but if she did, it could only help her. Therefore, let us assume she is given it; this is equivalent to saying she is given the other output of the beam splitter with its quadratures set to 0. Then the modes $E_I P$ together purify E_S . Any one-mode thermal state can be purified by a TMSV [1]. Hence, there exists some unitary acting only on the purifying systems E_I and P that results in a TMSV on the modes $E_S E_I$ with $\bar{n}'$ photons per mode (and a vacuum state on P).

All subsequent equations still hold.

The next paragraph, which begins “The expression for the maximum...” confuses upper and lower bounds and should instead read as follows:

The expression for the maximum secret key rate in this case is a lower bound: Giving Eve access to the purification mode P cannot decrease the Holevo bound on her mutual information, but it is not immediately obvious whether it increases it. It is, therefore, not obvious whether this lower bound is tight, or whether the power of the side channel would be even further reduced by the attenuation; this is a question that is open to further study.

[1] C. Weedbrook, S. Pirandola, R. Garcia-Patron, N. J. Cerf, T. C. Ralph, J. H. Shapiro, and S. Lloyd, *Rev. Mod. Phys.* **84**, 621 (2012).