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CORRIGENDUM

Corrigendum: A system’s wave function is uniquely determined by its underlying physical state (2017 New J. Phys. 19 013016)

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In the published version of this article [1] there is an omission in the intermediate calculation in appendix B that makes it difficult to verify the bound of equation (5). Furthermore, the form of $|\zeta^a|_z$ written in the displayed equation above equation (B1) in [1] is erroneous. We stress though that the bound (5) is correct and hence the conclusion of the paper is unaffected.

The issue arises because we write $Z_d^k n^2$ without stating which of the roots of $Z_d^k$ is taken. Furthermore, not all choices work. To state carefully a choice that works, we define $A[a]$ to be the number in $(-1/2, 1/2]$ that is equal to $v + m$ for some $m \in \mathbb{Z}$ and $B[b]$ to be the number in $(-1/2, 1/2)$ that is equal to $v + m$ for some $m \in \mathbb{Z}$. For $x \in \{0, \ldots, d - 1\}$ and $a \in \{0, 2, \ldots, 2n - 2\}$, the projectors $\Pi_x^a$ are along the vectors $|\zeta^a_x| = U_d Z_{n, a}[a] |x\rangle\langle j|$, where

$$Z_{n, a}[a] := \sum_{j=0}^{d-1} \exp \left( \frac{\pi i \text{sh}[j/d]}{n} \right) j\langle j|,$$

while for $y \in \{0, \ldots, d - 1\}$ and $b \in \{1, 3, \ldots, 2n - 1\}$, the projectors $\Pi_y^b$ are along the vectors $|\zeta^b_y| = U_d Z_{n, a}'[b] |y\rangle\langle j|$, where

$$Z'_{n, a}[b] := \sum_{j=0}^{d-1} \exp \left( \frac{\pi i \text{sh}[j/d]}{n} \right) j\langle j|.$$

These lead to the bound given in equation (5). For details of the rest of the calculation we refer to appendix B of [2].

Acknowledgments

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References

[1] Colbeck R and Renner R 2017 A system’s wave function is uniquely determined by its underlying physical state New J. Phys. 19 013016