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

Author(s):
Colbeck, Roger; Renner, Renato

Publication Date:
2018-03

Permanent Link:
https://doi.org/10.3929/ethz-b-000257508

Originally published in:

Rights / License:
Creative Commons Attribution 3.0 Unported
Corrigendum: A system's wave function is uniquely determined by its underlying physical state (2017 New J. Phys. 19 013016)

To cite this article: Roger Colbeck and Renato Renner 2018 New J. Phys. 20 039501

View the article online for updates and enhancements.
CORRIGENDUM

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

Roger Colbeck¹ and Renato Renner²

¹ Department of Mathematics, University of York, YO10 5DD, United Kingdom
² Institute for Theoretical Physics, ETH Zurich, 8093 Zurich, Switzerland

E-mail: roger.colbeck@york.ac.uk and renner@phys.ethz.ch

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 \( |\zeta^b_j^-\rangle \) 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 \( Z_{d,n}^j \) without stating which of the roots of \( Z_d \) is taken. Furthermore, not all choices work. To state carefully a choice that works, we define \( v_{shA} \) to be the number in \((-1/2, 1/2]\) that is equal to \( v + m \) for some \( m \in \mathbb{Z} \) and \( v_{shB} \) 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 \( \Pi^a_x \) are along the vectors

\[
|\zeta^a_x^-\rangle = U_d Z_{d,n}^a |a\rangle U_d^\dagger |x\rangle,
\]

while for \( y \in \{0, \ldots, d-1\} \) and \( b \in \{1, 3, \ldots, 2n-1\} \), the projectors \( \Pi^b_y \) are along the vectors

\[
|\zeta^b_y^-\rangle = U_d Z_{d,n}^b |b\rangle U_d^\dagger |y\rangle,
\]

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

We are grateful to Giorgos Eftaxias for discussions that led to the discovery of the problem.

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