QUANTUM INNOVATION 2023

CC-06-02

Inter-node quantum operations and assessment of devices for such operations

Akihito Soeda

National Institute of Informatics

Abstract

Global operations between network nodes are crucial to achieve any benefit of quantum computation. We have to design the individual network components appropriately so that they function as a single large quantum system when connected together. How to assess a single device for its expected quantumness when used to form a large network? And how to do so with as little experimental resources as possible? We explore the case of remote CNOT gate utilizing one Bell state and discuss how we can reduce the assessment complexity with respect to full quantum process tomography.