

Title:

Quantum Random Numbers generated by a Cloud Superconducting Quantum Computer

Abstract:

A cloud quantum computer is similar to a random number generator in that its physical mechanism is inaccessible to the users. In this respect, a cloud quantum computer is a black box. In both devices, the users decide the device condition from the output. A framework to achieve this exists in the field of random number generation in the form of statistical tests for random number generators. In the present study, we generated random numbers on the 20-qubit cloud quantum computer and evaluated the condition and stability of its qubits using statistical tests for random number generators. As a result, we observed that the qubits varied in bias and stability. Statistical tests for random number generators may provide a simple indicator of qubit condition and stability, enabling users to decide for themselves which qubits inside a cloud quantum computer to use.