Abstract

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A quantum information travel guide for mathematicians

The aim of this mini-course is to present some of the main directions of research in quantum information theory, with a focus on the mathematical techniques.

Outline:

1. Introduction

2. Quantum cryptography and communication
   2.1. Setup and main achievements
   2.2. Mathematical toolbox

3. Quantum computation and simulation
   3.1. Setup and main achievements
   3.2. Mathematical toolbox

4. Connections to other areas of mathematical physics

5. A selection of open problems