

Control-Target Inversion Property on Abelian Groups

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ABSTRACT

We show that the quantum Fourier transform on finite fields used to solve query problems is a special case of the usual quantum Fourier transform on finite Abelian groups. We show that the control-target inversion property holds in general. We apply this to get a sharp query complexity separation between classical and quantum algorithms for a hidden homomorphism problem on finite Abelian groups.

Keywords: Quantum Fourier transform, inversion property, hidden homomorphism problem.