Abstract Submitted
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Quantum Data Fitting NATHAN WIEBE, University of Waterloo — We provide a new quantum algorithm that efficiently determines the quality of a least-squares fit over an exponentially large data set by building upon an algorithm for solving systems of linear equations efficiently (Harrow et al., Phys. Rev. Lett. 103, 150502 (2009)). In many cases, our algorithm can also efficiently find a concise function that approximates the data to be fitted and bound the approximation error. In cases where the input data is a pure quantum state, the algorithm can be used to provide an efficient parametric estimation of the quantum state and therefore can be applied as an alternative to full quantum state tomography given a fault tolerant quantum computer.

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