MAR13-2012-008219

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Finding systematic errors in tomographic data: Characterising ion-trap quantum computers

THOMAS MONZ, University of Innsbruck

Quantum state tomography has become a standard tool in quantum information processing to extract information about an unknown state. Several recipes exist to post-process the data and obtain a density matrix; for instance using maximum-likelihood estimation. These evaluations, and all conclusions taken from the density matrices, however, rely on valid data - meaning data that agrees both with the measurement model and a quantum model within statistical uncertainties. Given the wide span of possible discrepancies between laboratory and theory model, data ought to be tested for its validity prior to any subsequent evaluation. The presented talk will provide an overview of such tests which are easily implemented. These will then be applied onto tomographic data from an ion-trap quantum computer.