Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Model Free Gate Design and Calibration For Superconducting Qubits DANIEL EGGER, FRANK WILHELM, Univ des Saarlandes — Gates for superconducting qubits are realized by time dependent control pulses. The pulse shape for a specific gate depends on the parameters of the superconducting qubits, e.g. frequency and non-linearity. Based on ones knowledge of these parameters and using a specific model the pulse shape is determined either analytically or numerically using optimal control [arXiv:1306.6894, arXiv:1306.2279]. However the performance of the pulse is limited by the accuracy of the model. For a pulse with few parameters this is generally not a problem since it can be "debugged" manually. He we present an automated method for calibrating multiparameter pulses. We use the Nelder-Mead simplex method to close the control loop. This scheme uses the experiment as feedback and thus does not need a model. It requires few iterations and circumvents process tomogrophy, therefore making it a fast and versatile tool for gate design.

Daniel Egger
Univ des Saarlandes

Date submitted: 14 Nov 2013 Electronic form version 1.4