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Quantum state reconstruction via continuous mesaurement ANDREW SILBERFARB, University of New Mexico, GREG SMITH, POUL JESSEN, University of Arizon, Tucson, IVAN DEUTSCH, University of New Mexico — We present a new procedure for quantum state reconstruction based on weak continuous measurement of an ensemble average. By applying controlled evolution to the initial state new information is continually mapped onto the measured observable. A Bayesian filter is then used to update the state-estimate in accordance with the measurement record. We discuss how this technique is employed to reconstruct the spin of a cesium atom, and present some relevant experimental data.

Andrew Silberfarb
University of New Mexico

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