Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

1/f flux noise and field-dependent spin susceptibility PRADEEP KUMAR, TAYLOR KLAUS, ANTONIO PUGLIELLI, STEVEN SENDELBACH, ROBERT MCDERMOTT, University of Wisconsin-Madison — Low-frequency 1/f magnetic flux noise is a dominant source of dephasing in superconducting Qubits. It is believed that the noise originates in a high density of surface magnetic defects, but the microscopic noise mechanism is not understood. Here, we describe investigations of the field-dependent complex susceptibility of the surface magnetic system. We have fabricated and characterized asymmetric dc SQUIDs that allow injection of a low-frequency excitation current directly into the SQUID loop to allow measurement of the SQUID inductance, which contains a contribution from the surface spin system. We observe a strong dependence of the SQUID inductance on applied dc field, which we attribute to field-dependent surface spin susceptibility. The data constrains possible models for 1/f flux noise from surface spin states.

Pradeep Kumar
University of Wisconsin-Madison

Date submitted: 14 Nov 2013 Electronic form version 1.4