

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

The Interplay of Spin and Charge Channels in Zero Dimensional Systems¹ MIKHAIL KISELEV, Institute for Theoretical Physics, Universität Würzburg, Würzburg D-97074, Germany, YUVAL GEFEN, Department of Condensed Matter Physics, The Weizmann Institute of Science, Rehovot 76100, Israel — We study the interplay of charge and spin (zero-mode) channels in quantum dots. The latter affects the former in the form of a distinct signature on the differential conductance. We also obtain both longitudinal and transverse spin susceptibilities. All these observables, underlain by spin fluctuations, become accentuated as one approaches the Stoner instability. The non-perturbative effects of zero-mode interaction are described in terms of the propagation of gauge bosons associated with charge (U(1)) and spin (SU(2)) fluctuations in the dot, while transverse spin fluctuations are analyzed perturbatively.

¹We acknowledge support by SFB-410 grant and through the Heisenberg program of the DFG (MK), an ISF grant of the Israel Academy of Science, the EC HPRN-CT-2002-00302-RTN and the AvH Foundation (YG).

Mikhail Kiselev
Institute for Theoretical Physics, Universität Würzburg, Würzburg D-97074, Germany

Date submitted: 30 Nov 2005

Electronic form version 1.4