Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Critical Fidelity at the Metal-Insulator Transition JOSHUA BODYFELT, Wesleyan University, GIM SENG NG, TSAMPIKOS KOTTOS, Wesleyan University, Max Planck Institute for Dynamics and Self-Organization — Using a Wigner Lorentzian Random Matrix ensemble, we study the fidelity, $F(t)$, of systems at the Anderson metal-insulator transition subject to small perturbations that preserve the criticality. We find that there are three decay regimes as perturbation strength increases: the first two are associated with a Gaussian and an exponential decay respectively and can be described using Linear Response Theory. For stronger perturbations, $F(t)$ decays algebraically as $F(t) \sim t^{-D_2^{\mu}}$, where D_2^{μ} is the correlation dimension of the Local Density of States.

Joshua Bodyfelt
Wesleyan University

Date submitted: 20 Nov 2006 Electronic form version 1.4