Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Violation of time reversal invariance in ensembles with random interactions. VOLHA ABRAMKINA, Illinois College, ALEXANDER VOLYA, Florida State University, VLADIMIR ZELEVINSKY, Michigan State University — Studies of low-energy spectrum in fermionic systems driven by random Hamiltonians allow to shift a focus of attention from specifics of interactions to the role of conservation laws and geometry of a system. The two-body random ensemble (TBRE) with rotational symmetry is based on the shell model approach and is relevant to such a discussion in context of nuclear structure. It has been shown that the probability for the ground-state spin to be zero is enhanced in the rotationally invariant TBRE. A zero ground-state spin in all realistic even-even nuclei is attributed to a superconducting state, this paired state is not what determines the ground state properties when interactions are random. It is plausible that one of the reasons of this enhancement is the time-reversal (T) invariance. To elucidate the effect of the T-invariance we embedded the randomly interacting system in an external magnetic field and thus broke the symmetry. The effect of this Coriolis force is compared with the statistical theory. The violation of the T-invariance by different types of scalar one-body Hamiltonian terms is also considered.

Volha Abramkina
Illinois College

Date submitted: 09 Jan 2012 Electronic form version 1.4