Abstract Submitted
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Anomalous fluctuations of s-wave reduced neutron widths of ^{192,194}Pt resonances[1] P.E. KOEHLER, ORNL, F. BEČVÁŘ, M. KRTIČKA, Charles University, J.A. HARVEY, K.H. GUBER, ORNL — Neutron resonance parameters remain some of the most important information for testing random matrix theory (RMT), even more than fifty years after such data served as the original impetus for its creation. RMT implicitly assumes that reduced neutron widths $\Gamma^0_{\lambda n}$ of s-wave resonances λ follow a Porter-Thomas distribution (PTD). Currently, the overwhelming consensus is that $\Gamma^0_{\lambda n}$ data agree with the PTD. However, there are problems with both the data and analysis techniques (mostly 1970's vintage) used in previous tests of the PTD that call those results into question, so it is still worthwhile to perform new tests. We obtained an unprecedentedly large number of s-wave neutron widths through $\mathcal{R}$-matrix analysis of neutron cross-section measurements at the Oak Ridge Electron Linear Accelerator (ORELA) facility on enriched Pt samples. Careful analysis of these data rejects the validity of the Porter-Thomas distribution with a statistical significance of at least 99.997%. To our knowledge, this result represents the most stringent test of the PTD to date, and the observed disagreement could have far-reaching consequences.

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