A maximum likelihood method based on the Δ_3 statistic to correct for missed levels.

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Abstract

The $\Delta_3(L)$ statistic is a commonly used statistic in random matrix analysis of neutron resonance data. It is reported as the spectral average of the fluctuations in the number of levels in a window of length L in the spectrum. The average is taken over the position of the window, and each position yields a random number. In this work, the distribution of these random numbers is parameterized from numerical simulations, and then used as the basis for a maximum likelihood method to gauge the fraction of levels missed from a spectrum. Neutron resonance data and the acoustic spectra of microwave cavities are examined.

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