

Correlations within the spectrum of a large quantum graph

Gregory Berkolaiko

Department of Mathematics

Texas A&M University, College Station, TX

We will begin with the description of the quantum graphs, the random matrix conjecture as it applies to the graphs and one of the main tools of the analysis of correlations in the spectrum: the trace formula.

We will then discuss the combinatorial ideas behind the first few terms of expansion of a function which is used to measure the correlations within the spectrum, the form factor.

To conclude, we will review the recent advances in this question achieved by other tools (super-symmetry methods) and will also discuss the possibility of using recent advances in the study of the similar questions on billiards.