מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, May 23, 2019
at 13:30

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Texas A&M

Nodal statistics of graph eigenfunctions

Abstract:

Understanding statistical properties of zeros of Laplacian eigenfunctions is a program which is attracting much attention from mathematicians and physicists. We will discuss this program in the setting of "quantum graphs", self-adjoint differential operators acting on functions living on a metric graph. Numerical studies of quantum graphs motivated a conjecture that the distribution of nodal surplus (a suitably rescaled number of zeros of the n-th eigenfunction) has a universal form: it approaches Gaussian as the number of cycles grows. The first step towards proving this conjecture is a result established for graphs which are composed of cycles separated by bridges. For such graphs we use the nodal-magnetic theorem of the speaker, Colin de Verdiere and Weyand to prove that the distribution of the nodal surplus is binomial with parameters p=1/2 and n equal to the number of cycles. Based on joint work with Lior Alon and Ram Band.

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