

## Neumann domains on metric graphs

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The Neumann points of an eigenfunction  $f$  on a quantum (metric) graph are the interior zeros of  $f'$ . The Neumann domains of  $f$  are the sub-graphs bounded by the Neumann points. Neumann points and Neumann domains are the counterparts of the well-studied nodal points and nodal domains.

We present the following three main properties of Neumann domains: their count, wavelength capacity and spectral position. We study their bounds and probability distributions and use those to investigate inverse spectral problems.

The relevant probability distributions are rigorously defined in terms of selected random variables for quantum graphs. To this end, we provide conditions for considering spectral functions of quantum graphs as random variables with respect to the natural density on  $\mathbb{N}$ .

The talk is based on joint work with Lior Alon.