Graph structure of the nodal set on Riemannian manifolds

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November 4, 2024

We illustrate and draw connections between the geometry of zero sets of eigenfunctions, graph theory, vanishing order of eigenfunctions, and unique continuation. We identify the nodal set of an eigenfunction of the Schrödinger operator (with smooth potential) on a compact, orientable Riemannian manifold as an imbedded metric graph and then use tools from elementary graph theory in order to estimate the number of critical points in the nodal set of the k-th eigenfunction and the sum of vanishing orders at critical points in terms of k and the genus of the manifold. Based on a joint work with Matthias Täufer.