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Subdivision and Adjacency spectra of Graphs

Let G be the a graph with n vertices. Let $A(G)$ be its adjacency matrix. We denote the eigenvalues of $A(G)$ by

$$\lambda_1(G) \geq \lambda_2(G) \geq \cdots \geq \lambda_n(G).$$

Let $S \subseteq E(G)$. For $t \geq 1$, we define $G_t = G_t(S)$ to be the graph obtained from G by replacing each edge $uv \in S$ with a path P_{uv} of length t.

In this talk, we investigate the asymptotic nature of graph spectra when some edges of a graph are subdivided sufficiently many times. We show that, for a fixed k, the sequence $\{\lambda_k(G_t)\}_{t=0,1,2,\ldots}$ is a Cauchy sequence.

This is a joint work with Hitesh Kumar, Bojan Mohar and Hanmeng Zhan.