Non-canonical connectivity measures on metric graphs

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Fiedler proposed the "algebraic connectivity" – i.e., the spectral gap of the graph Laplacian – as a measure of connectivity of discrete graphs; an analogous idea was substantiated by a two-sided bound on the spectral gap of the metric graph Laplacian obtained by Nicaise (1987) and Kennedy-Kurasov-Malenová-Mugnolo (2016).

Further, possibly "more geometric" quantities can be shown to describe the connectivity of a metric graph, too. I will focus on the mean distance, a rather natural quantity that can be defined on each compact metric measure space. After presenting geometric bounds on this quantity, I will show its interplay with the spectral gap of the metric graph Laplacian and outline some similarities with the Kohler-Jobin inequality for metric graphs. This is joint work with Luis Baptista and James B. Kennedy.