Changing the Uniform Spectrum

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A graph is said to be k-uniformly connected if there exists a path of length k between each pair of vertices. This generalizes the well-known concept of a Hamiltonian-connected graph - a graph, order n, in which there exits a Hamiltonian path (path of length $n-1$) between each pair of vertices. That is, a graph is Hamiltonian-connected if and only if it is $(n-1)$-uniformly connected. One can also say a graph is complete if and only if it is 1-uniformly connected. The uniform spectrum of a graph G is the set of all k for which G is k-uniformly connected. In this paper, we investigate the impact of adding or deleting vertices or edges on the uniform spectrum of a graph. Some general results are presented as well as analyses of specific classes of graphs such as bipartite graphs and wheels.

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