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*Continuous quantum walks on locally finite graphs.*

A continuous quantum walk on a graph with adjacency matrix is determined by its transition matrix  $U(t) = \exp(itA)$ . We are interested in locally finite infinite graphs. The entry  $(U(t))_{0,0}$  of  $U(t)$  is the characteristic function of a probability distribution, the spectral density of the adjacency matrix of the graph. I will discuss two interesting cases. For the first, the unweighted path,  $(U(t))_{0,0}$  is a Bessel function, and we will see what this tells us about the continuous walk. For the second, we describe a locally finite graph (using the Poisson distribution) where the vertex 0 is periodic; this is interesting because we have shown that connected bounded infinite graphs cannot contain a periodic vertex.