1125-05-2788 **Mark Kempton*** (mkempton@cmsa.fas.harvard.edu). *Quantum state transfer on graphs with potential.* Preliminary report.

Given a graph, we can describe the evolution of the quantum state of a particle moving along the edges of the graph. We say the perfect state transfer occurs if, given a particle starting at a vertex, there is a time at which the particle is at another single vertex with probability one. Considerable research has been done recently studying perfect state transfer on graphs, and it seems to be a rather rare phenomenon, and constructing examples is quite difficult. We study the effects of adding a potential to the vertices of the graph–that is, a function that assigns an amount of energy to each vertex of the graph. We show, in particular, that there are examples of graphs where perfect state transfer does not occur, but where adding a potential makes it possible. We also study the case of paths. Our techniques involve studying how the spectrum of the adjacency matrix of a graph is affected by adding a diagonal matrix. (Received September 20, 2016)