
HARMONY ZHAN, University of Waterloo
Spectra of Discrete Quantum Walks

Due to the extra coin register, the relation between the spectrum of a discrete quantum walk and the spectrum of the underlying graph X is in general unclear. However, in the model where the transition matrix U is a product of two reflections, the eigenvalues and eigenvectors of U are completely determined by those of X . In fact, U is closely related to the directed line graph of X . We will derive the spectral decomposition of U and use it to construct a family of circulant graphs that admit perfect state transfer.