

1116-81-764

Hideo Mitsuhashi* (mitsu@cc.utsunomiya-u.ac.jp), 350 Minemachi, Utsunomiya, Tochigi 321-8505, Japan, and **Norio Konno** and **Iwao Sato**. *The discrete-time quaternionic quantum walk and the second weighted zeta function on a graph.*

Recently, quaternionic quantum walks was formulated by Konno and various properties of them were studied. We define a discrete-time quaternionic quantum walk on a graph that can be viewed as an extension of the Grover walk on a graph to the case of quaternions, and study the properties of it. We give the unitary condition on the transition matrix of the quaternionic quantum walk. Under some condition, we determine all the right spectra of the transition matrix by some easily derivable parameters from the transition matrix by using of the theory of the second weighted zeta function. (Received September 12, 2015)