

1106-46-2146 **Tatsuya Tate*** (tate@math.tohoku.ac.jp). *Powers of certain quantum walks*. Preliminary report.

The notion of quantum walks are defined as a non-commutative analogue of the usual random walks and they are investigated mainly in quantum physics, information science, combinatorics and probability theory. As in the theory of random walks, one of the main issues for the quantum walks is to find various asymptotic properties of transition probabilities, which are defined by using the powers of a unitary operator expressing a quantum walk, and hence it is important to understand powers of quantum walks. In this talk an effective and concrete formulas for the powers of certain quantum walks are given. These formulas involve the Chebyshev polynomials and it can be used to deduce weak limit distributions. Weak limit distributions for the class of quantum walks which will be discussed in this talk has been already known before. However it would be rather important to get precise and effective formulas for the powers itself to clarify the qualitative structures of quantum walks. In the talk, some relations between these formulas and the affine Weyl group of type A are also discussed. (Received September 15, 2014)