

# Generalized Quantum Walks: definitions and some asymptotics

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Open quantum walks (OQWs) [1] were introduced as quantum analogues to classical Markov chains. In contrast to unitary quantum walks [2], OQWs are driven by the dissipative interaction with the environment and are formulated in the language of open quantum systems [3]. OQWs demonstrate rich dynamical behaviour [1,4]. Another benefit of OQWs is in the well-defined classical limit [5]. The unitary quantum walks are gaining computational power from the quantum interference between the nodes of a walk and the asymptotic behaviour of them is highly non-gaussian [2].

In this talk, I will introduce generalized quantum walks, which includes OQWs and Unitary QWs as limit cases. Using recently developed central limit theorem for lazy OQWs [6] I will present an analytical result for the asymptotic of generalized quantum walks in one regime of parameters. For another range of parameters, some numerical evidence of the asymptotic behaviour would be presented.

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