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A generalization of Schur functions, classical random walks, unitary and open quantum walks.

I will describe some of the results in a recent manuscript with Luis Velazquez, arXiv 1702.04032

The notion of Schur function originating in complex analysis has applications to unitary quantum walks as described in joint papers with J. Bourgain, L. Velazquez, A. Werner, R. Werner and J. Wilkening . In particular it gives a dynamical interpretation for the first return amplitudes for such a walk and has a role in the study of recurrence and expected return times. Furthermore certain factorization properties of these functions correspond to compositions of simpler walks.

We show here that this approach works well for classical walks as well as open quantum walks. Our results make contact with work of J. Asboth, I. Jex, T. Kiss, Z. Kurucz, C. Lardizabal, P. Sinkovicz and M. Stefanak.