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Pretty Good Fractional Revival via diagonal perturbation

Continuing our study of the effect of magnetic fields on state transfer, in this talk we focus on Pretty Good Fractional Revival (PGFR) in the setting of continuous time quantum walks on graphs. Fractional Revival is a generalization of Perfect State Transfer, in which the walk, at a specific time, is required to return to a fixed "starting subset" of nodes with probability 1. PGFR is then the usual asymptotic relaxation where only the supremum of this probability (as time goes to infinity) needs to be 1.

We develop the requisite spectral and number-theoretic tools to prove PGFR under a generic diagonal perturbation (aka magnetic field) and show how to construct examples of PGFR based on this theory. A key point is that we are able to generalize everything to subsets of more than 2 nodes, which would be the standard setting for state transfer.

Joint work with Mark Kempton.