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Equitable partitions and twin subgraphs

In this talk, we prove a fundamental result about equitable partitions on weighted graphs with twin subgraphs, and use this result to construct graphs with pair and plus state transfer. In particular, for $\tau \in \{\frac{\pi}{2}, \frac{\pi}{\sqrt{2}}\}$, we show that almost all connected planar graphs admit pair state transfer at time τ , and almost all connected planar graphs can be assigned a single negative edge weight resulting in plus state transfer, or perfect state transfer between a plus state and a pair state, at time τ . Using a result of Schwenk, analogous results will also be shown to hold for trees. This is joint work with Chris Godsil, Steve Kirkland, Sarojini Mohapatra, and Hiranmoy Pal.