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Chris Godsil* (cgodsil@uwaterloo.ca), Canada. *Average mixing on graphs*. Preliminary report.

If X is a graph with adjacency matrix A , then we define $H(t)$ to be the operator $\exp(itA)$. The Schur (or entrywise) product $H(t) \circ H(-t)$ is a doubly stochastic matrix and, because of work related to quantum computing, we are concerned with the related *average mixing matrix*, defined to be

$$\lim_{C \rightarrow \infty} \int_0^C H(t) \circ H(-t) dt.$$

I will discuss this matrix and some of its properties. These can be surprising, for example it is guaranteed to be rational, and it can in a sense have more symmetry than its underlying graph. (Received September 11, 2011)